33rd YEAR

CHEMICAL WEEKLY

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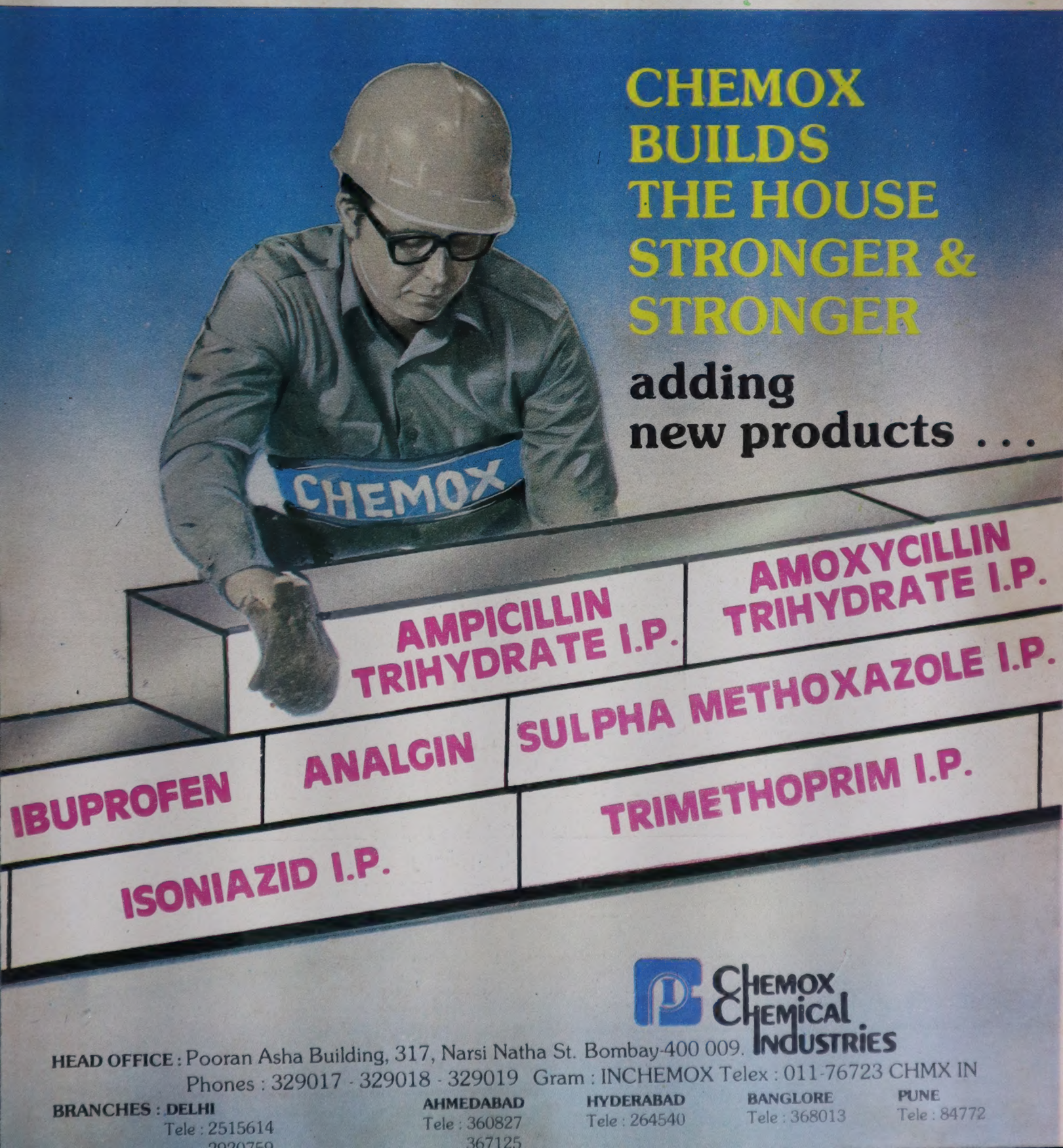

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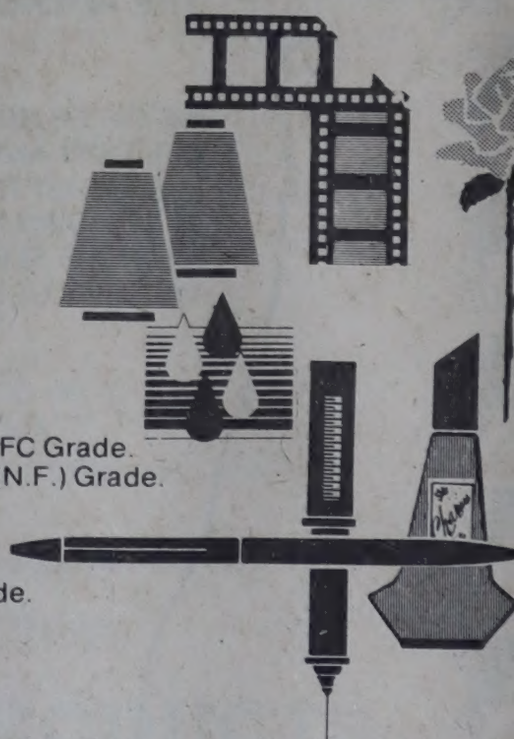

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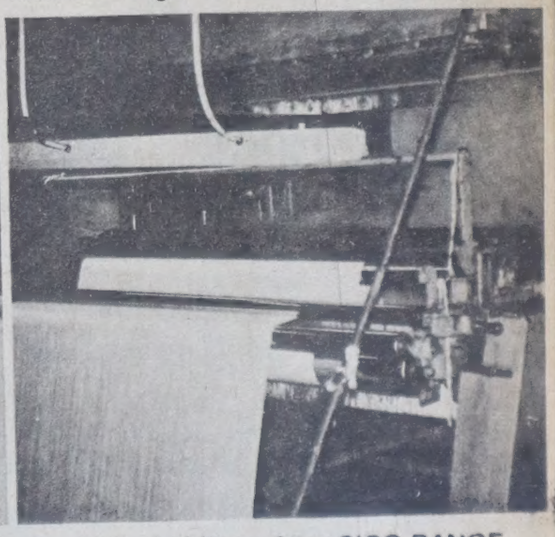

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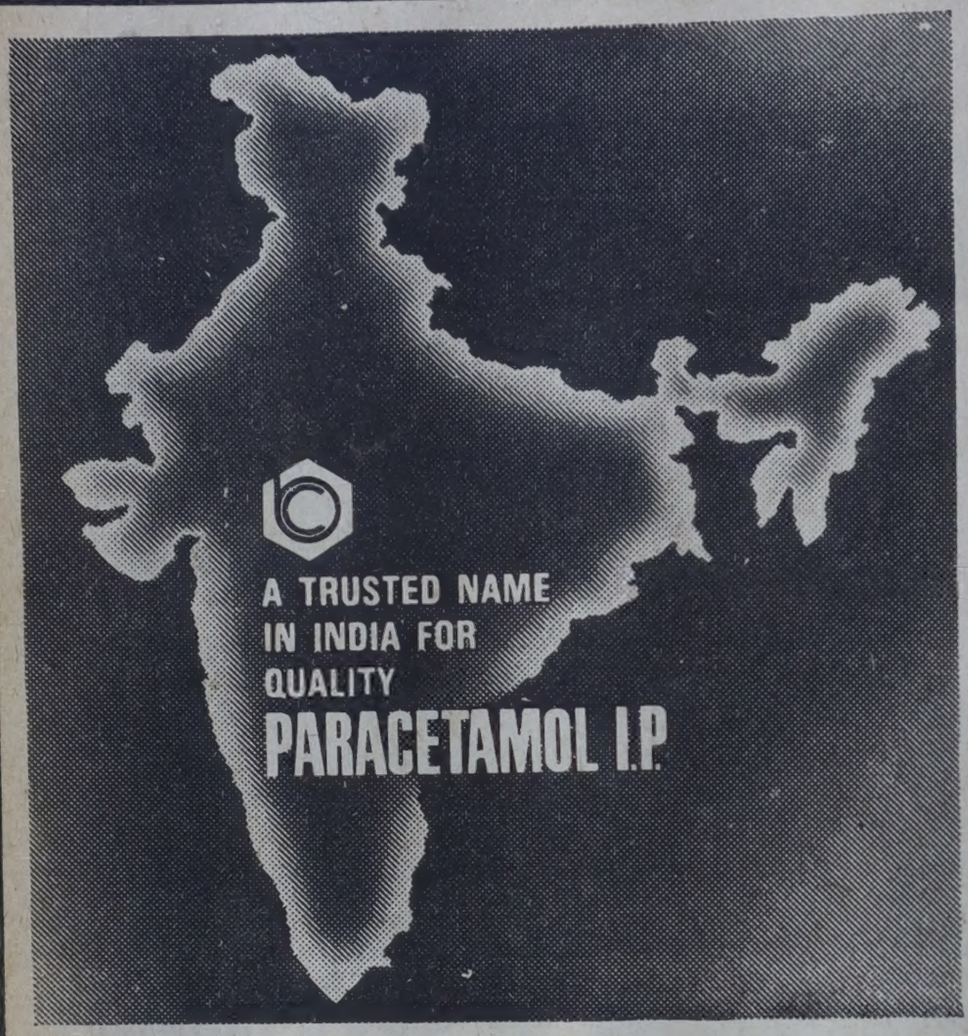

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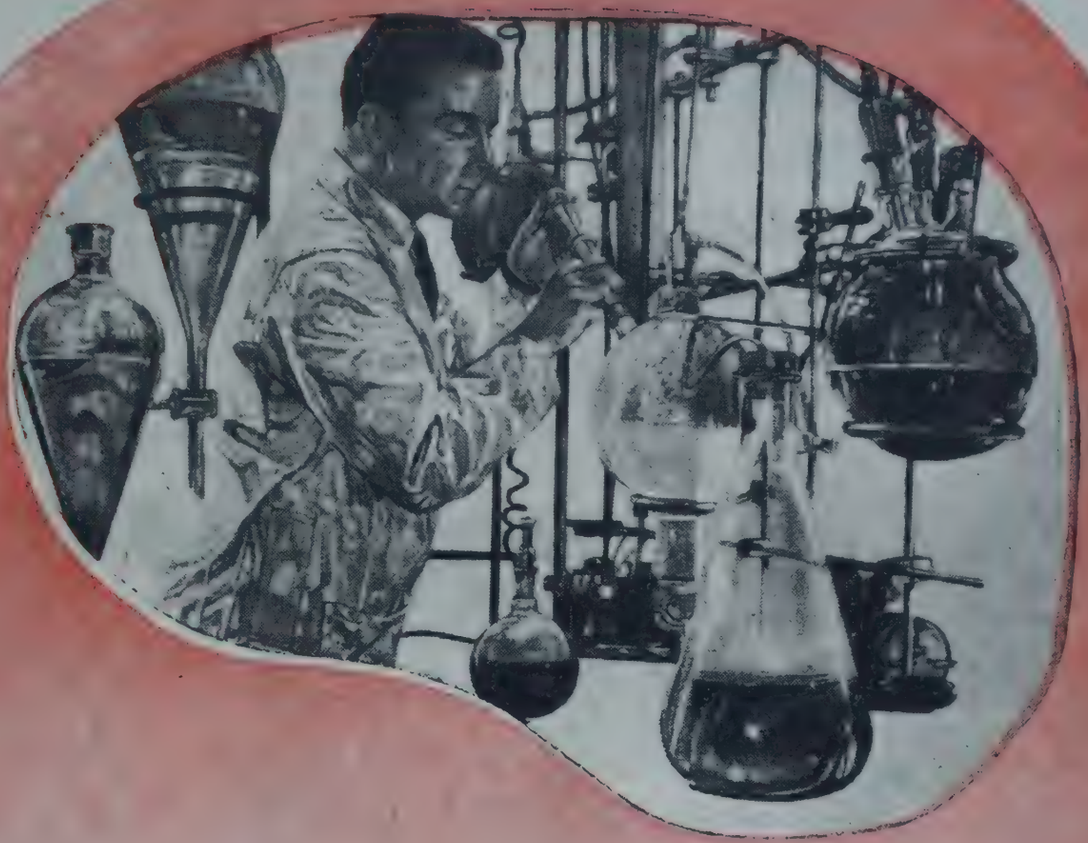

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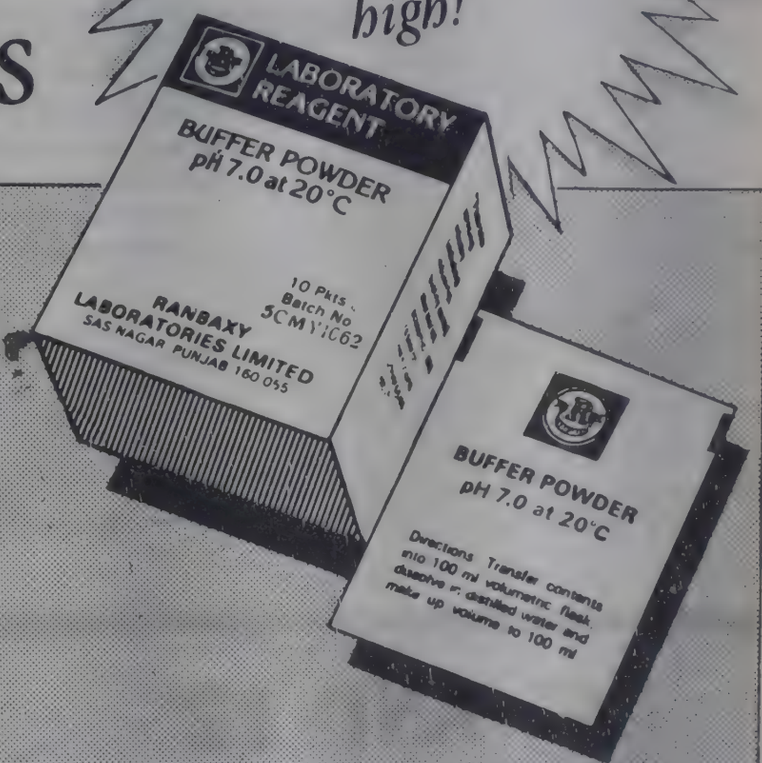
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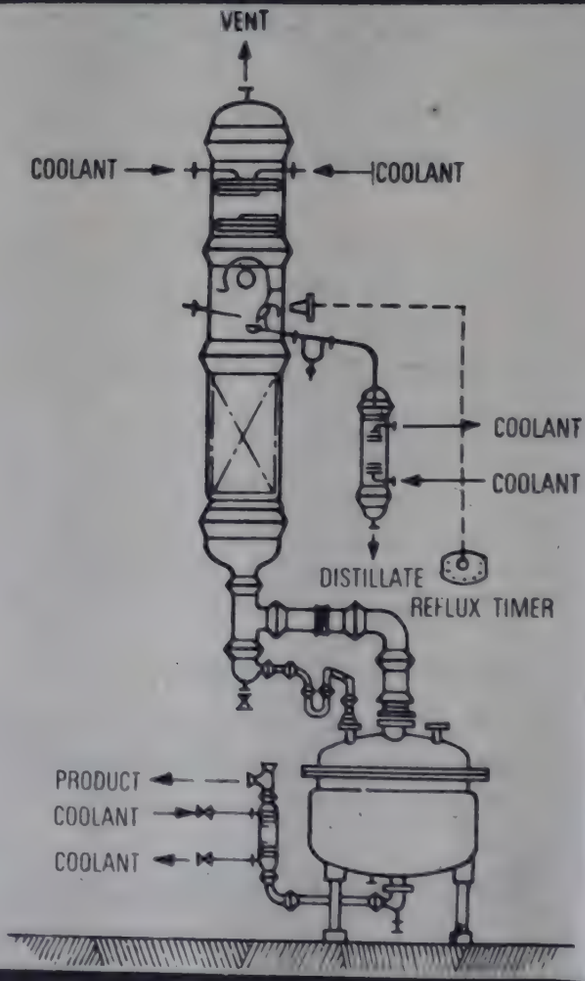

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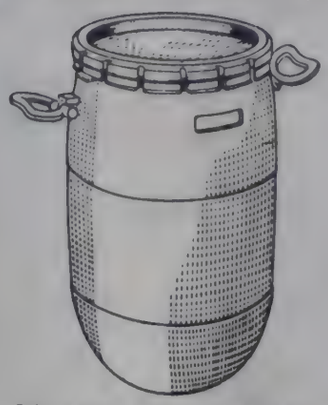
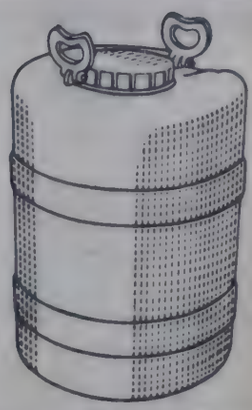
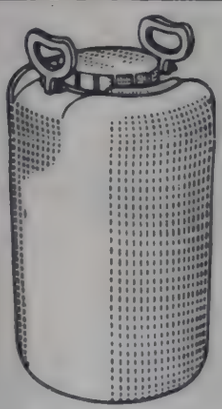


30 Kgs. Round Drum
Full Top Open – 10" Cap

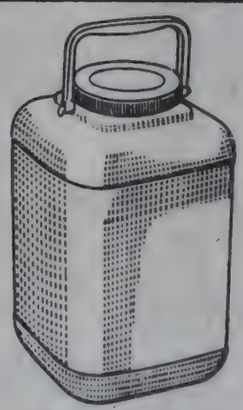


50 Kgs. Round Drum
– 6" Cap



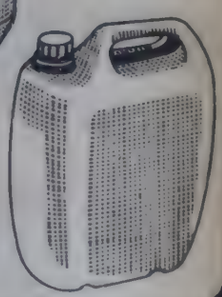
30 Kgs. Round Jar
– 6" Cap

20 Kgs. Round Jar
– 6" Cap

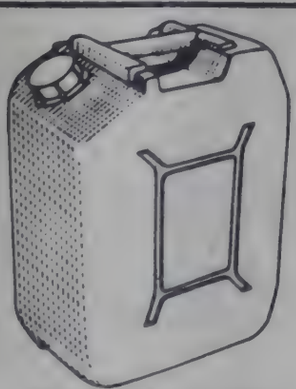


6 Kgs. Square Jar
– 4" Cap

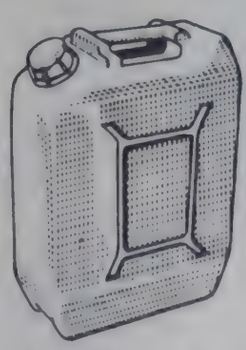
5 Ltrs.
Jerry Can



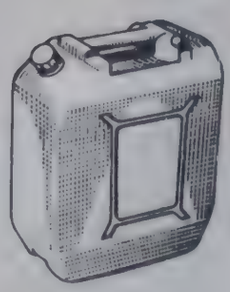
6 Ltrs.
Jerry Can



30 Ltrs. Jerry Can
Stackable



20 Ltrs. Jerry Can
Stackable



10 Ltrs. Jerry Can
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1 Ltr.
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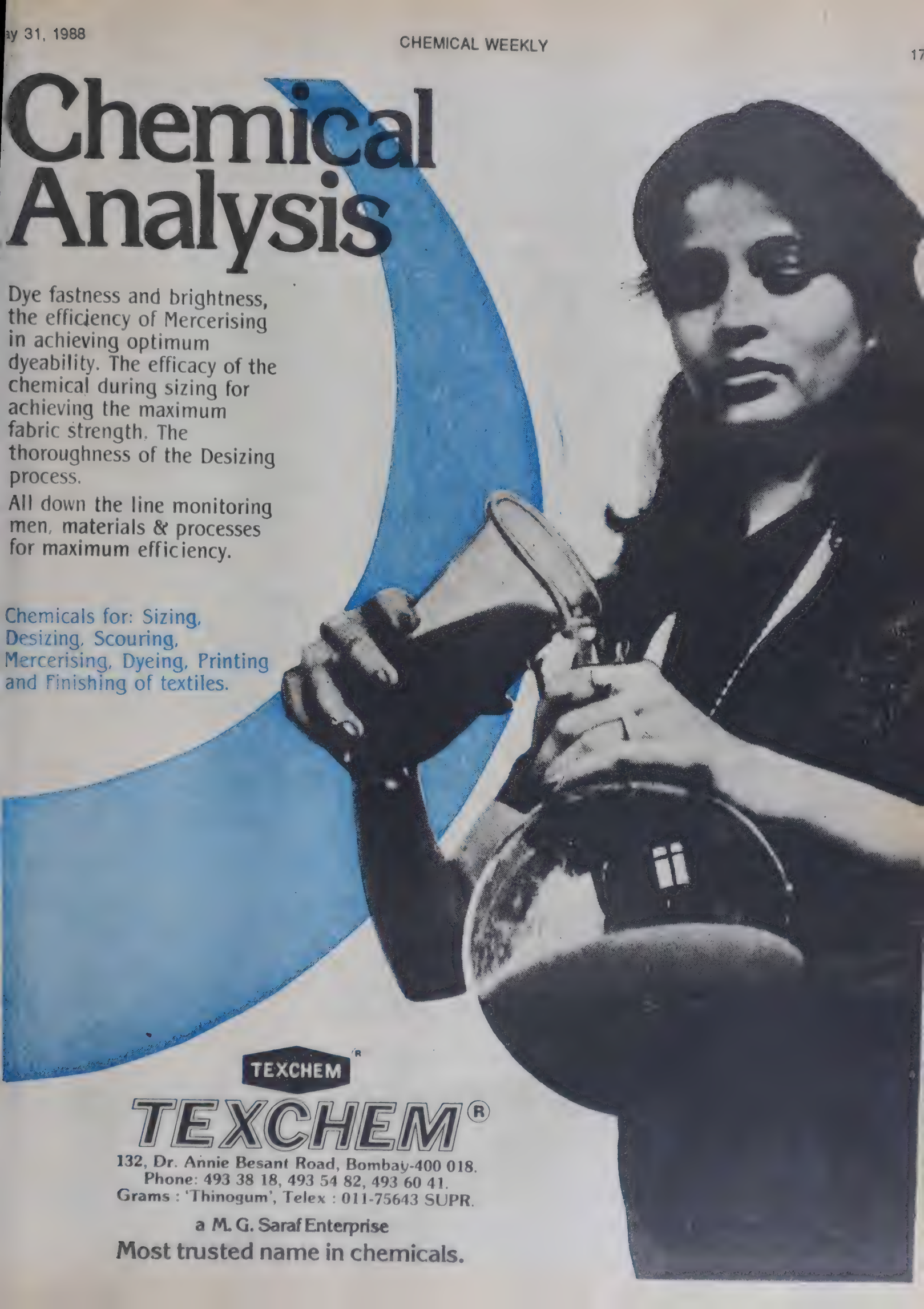

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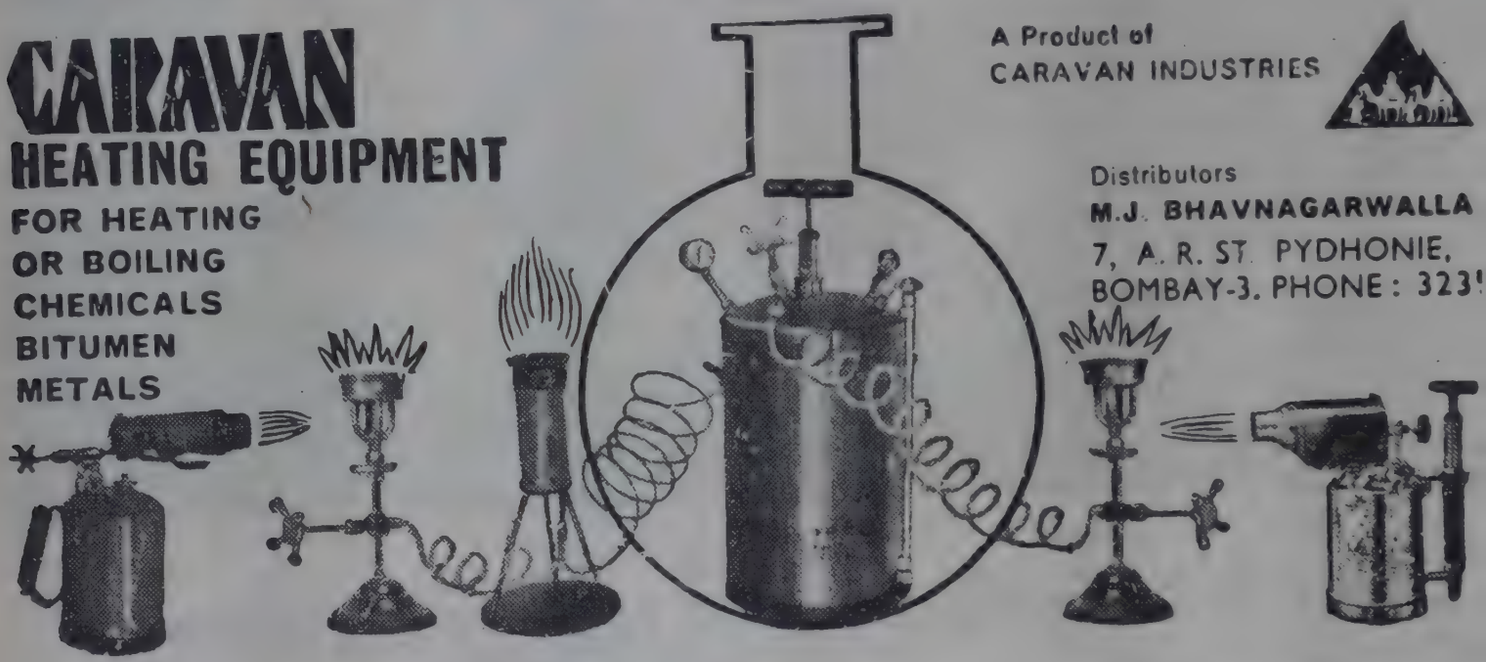

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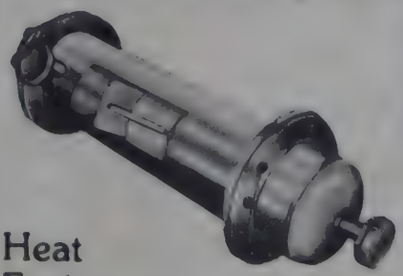
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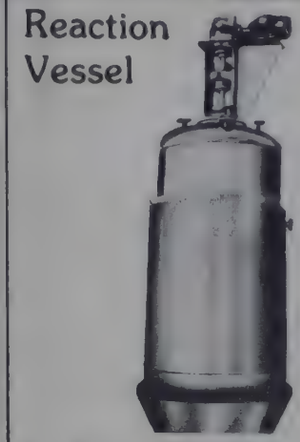
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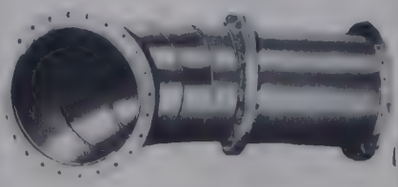
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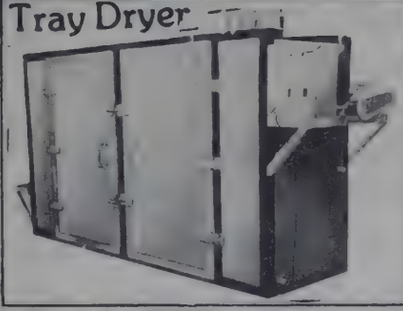
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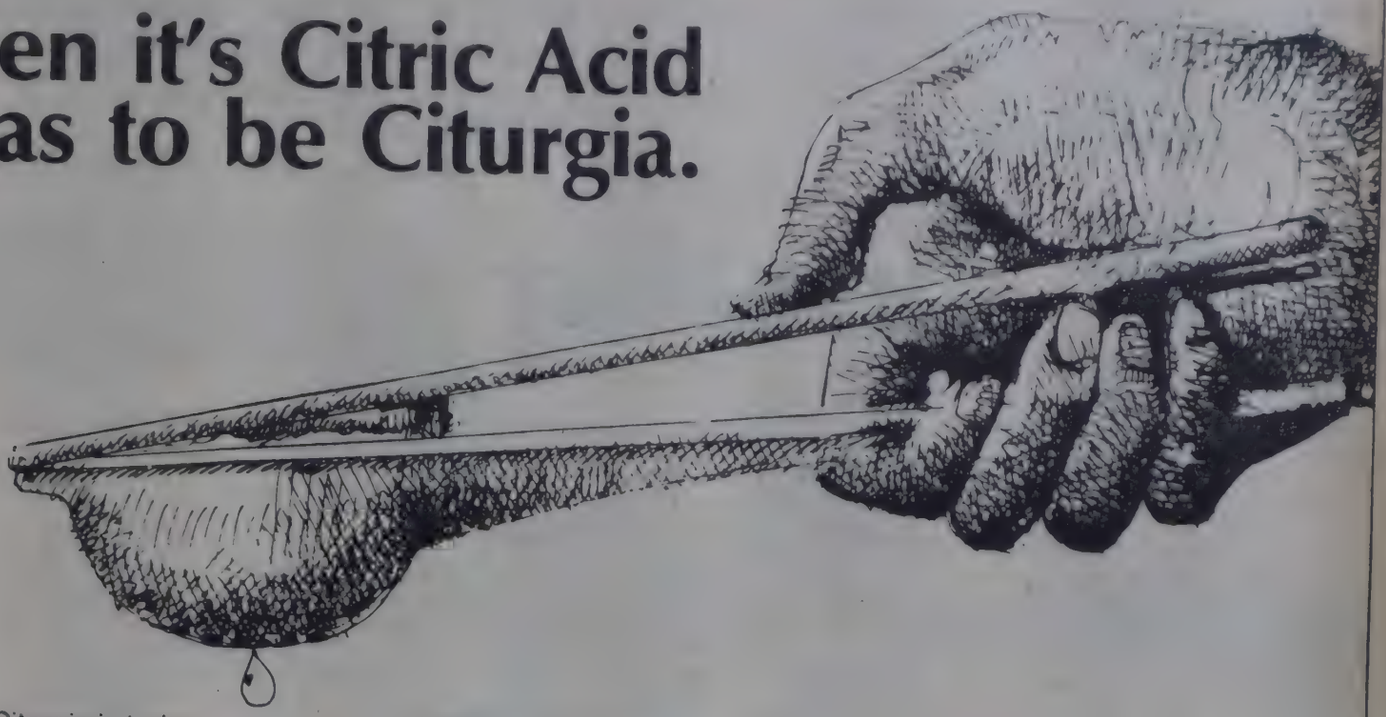

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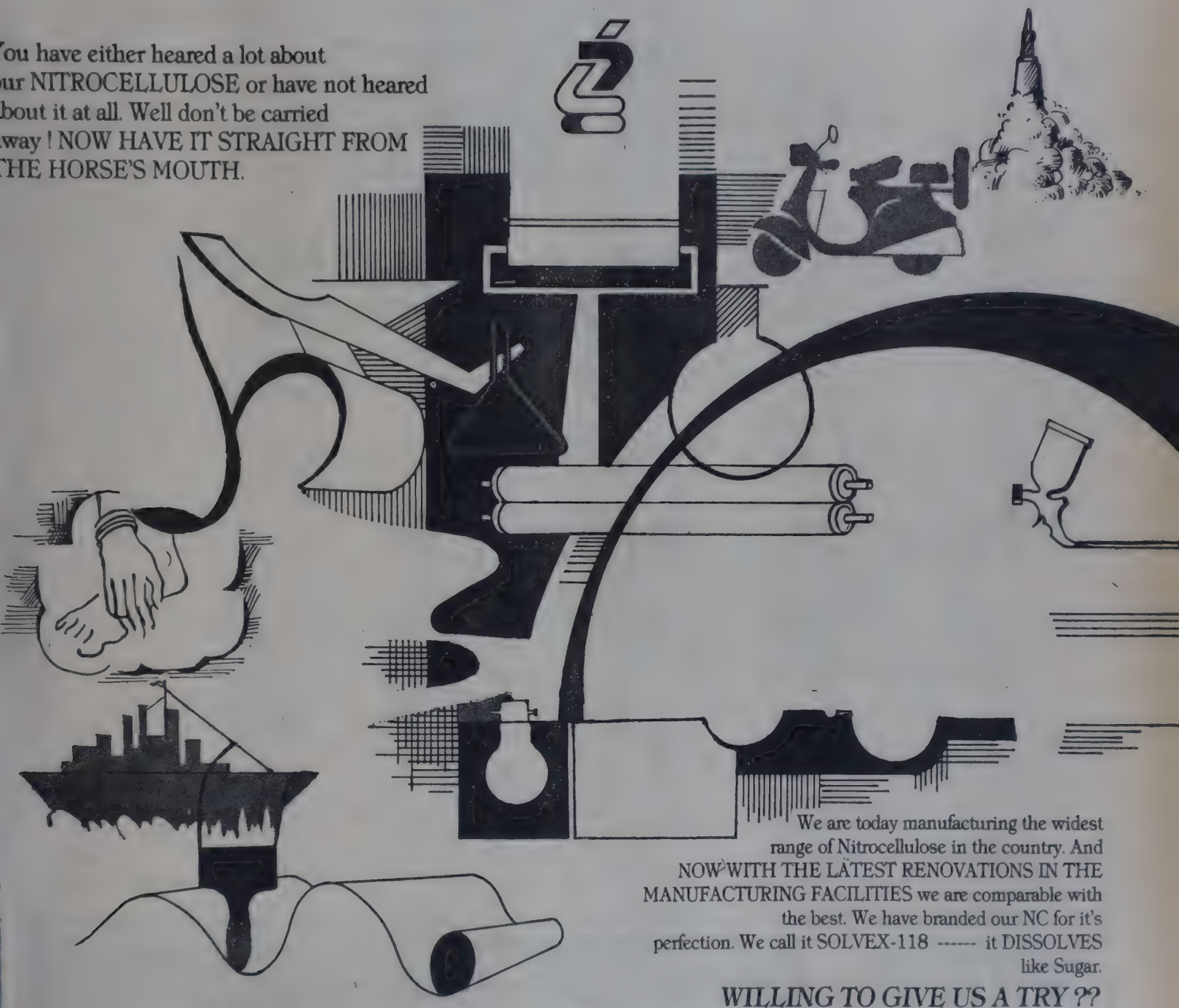

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CHEMICAL WEEKLY

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Fast Moving Wind Energy

"The greatest terrestrial medium for harvesting, harnessing, and conserving solar energy is the wind" was the view expressed by Buckminster Fuller decades ago.

The wind has its origin in the atmospheric temperature difference generated by the incident solar radiation which causes pressure differentials. It is a mechanism which aids the dissipation of potential energy accumulated in the pressure differential as Kinetic energy. Utilisation of wind energy for lifting water from wells is an ancient concept. Egyptian sources refer to this practice in 3900 BC and India's claim dates back to the Fourth Century BC. In popular imagination wind mills are always associated with the Dutch landscapes. Don Quixote tilting at the wind mills has been part of English idiom since the 16th century. Wind mills represent the earliest instance of the export of technology from the East to the West, as far back as the 12th century.

About one to ten million megawatts of usable power is estimated to be continuously available in the winds blowing around the earth. Wind energy, is one source, of nature's bounty that man has failed to utilise to any noticeable extent. On the face of it the concept of exploiting wind energy appears to be simple but in actual practice, the mechanical engineering problems to be surmounted are indeed considerable. Since 1890, wind mills have also been used to generate electricity as a logical consequence of the invention of the Direct Current (DC) generator.

Wind is the single most unpredictable, variable energy source. It can change direction and speed at any time. If wind doubles its speed, say from 16 to 32 Kms per hour, it can, in less than a second increase its force eight times and cause enormous damage to the blades. These machines do not always spin at top speed. Actual power produced is only about 20% of its rated capacity. The first purely commercial contract for a multi megawatt wind energy converter in the United States was signed only in early 1980 by the Government's Water and Power Resources Service. The commercially available machines upto 1984 had typical power ratings upto 55 KW which are currently being utilised in India too.

The experience of the State of California offers the most successful example of the exploitation of wind energy for power generation. The State has three of the country's windiest spots --Altamount Pass, 40 miles east of San Francisco has more tha 5,000 wind turbines spread over 12,000 hectares of pasture lan the Tehachapi mountains, house over 3,500 wind mills in the dese zone and another lot of 3,500 units are at the San Gorganio pas leading to Palm Spring.

California, which accounts today for at least 80% of the world' generated power, illustrates the need for financial support fro the State in the early stages of development. The main reaso for the spurt in wind farming was the fact that in 1981 the US Government, in an effort to encourage the use of renewable sources of energy, offered enormous tax incentives to producers of electricity from wind energy. Electricity companies were compelled by law to accept privately generated wind mill power into the grids at rates very favourable to the producer.

In 1986, there were an estimated 13,023 turbines in California. The wind-energy power operators, produced in the last quarter of 1986, 450 million KW of power -- enough electricity to meet the annual requirements of 750,000 homes. They achieved this with 12% capacity rate, which figure the technologists are seeking to improve at least to 20%.

The State that ranks second to California in the matter of well utilised wind power is Hawaii. The trade winds that blow over the islands for most of the year are their most valuable source of renewable energy and it is estimated that they can help generate ten times the island's needs of power. Hawaii has only 250 wind machines. On the island of Oahu is the high techwind farm called Makani Moa'e (meaning trade winds) already producing enough electricity to fulfil all the demands of its 5,200 residents effecting an annual energy saving equal to 62,000 barrels of oil.

Commercial wind turbines range in size from 0-50 kilowatt to 200 kilowatts or more. In California 21% of the wind machines are in the 0-50 KW range, 65% are in the 51-100 KW range and 14% longer than 101 KW. According to Thomas Gray, Executive Director of the American Wind Energy Association, start up costs range between $1200 to $1500 for each kilowatt capacity. A 100 KW machine will cost anywhere between $120,000 to $150,000. U.S. Wind Power's 100 kilowatt machine Model 56-100, has three variable fibre glass blades, a drive shaft transmission and brake located

atop a 60 ft. tower. A microprocessor linked to a computer allows for remote operation. The 50-100 model operates at its rated capacity of 100 KWs with wind speed between 46 and 70 Km/hr. It generates no power under 19 Km/hr and ceases operation over 70 Kph. The company has on hand a programme to put up 200-300 KW turbine.

The British Isles lie in the path of strong winds which sweep in from the surrounding seas. The energy fluxes are large and reach over 500 KWh/square meter per year in the western and northern regions. Recently, exciting developments have been taking place in the field of exploitation of renewable energy sources, particularly wind energy and more particularly wind power.

Over the past three years since 1985, more than 1500 MW of wind farms have been built in California and that too at a rate infinitely faster than what could have been achieved with coal or nuclear state. Three years ago, wind turbines were demonstratably unreliable and costly to maintain. They were expensive in relation to the power they could generate and it was only the enormous tax incentives that made them viable. Three years ago, the wind industry was in its infancy and no British manufacturer had built a wind farm.

The British Wind Energy Association (BWEA) claims that wind turbines could now be built in quantity very quickly and cheaply. On good windy sites in the United Kingdom generation costs for wind energy could be as low as 2p/KWh (40/45 paise) as against 3p/KW (60-70 paise) or more for other methods of generating. These claims were treated initially with considerable scepticism but have now come to be accepted. Wind turbine prices have fallen dramatically and British manufacturers have taken the lead, developing larger units and achieving better performances over their American and Danish competitors.

The Wind Energy Group (WEG) of the United Kingdom is a Consortium led by Taylor Woodrow, associating British Aerospace and GEC. This group has built 20 numbers of 250 KW wind turbines in the Californian desert during December 1986. This 5 MW wind farm started operating on 1st January 1987, and it has proved staggeringly successful, making the figures quoted by BWEA look very modest. The Central Electricity Board of Great Britain (CEGB) claims a winter peak plant availability of 88% with larger and newer plants touching 92% following by nuclear plants at 80%. The California wind farms have achieved 95% in 1984-85 and are expected to settle down at 98% soon. The wind energy farms are considered more reliable than other forms of power generation except perhaps hydro electrically.

The rapid repair times that can be achieved with small unit sizes explain the relative ease with which such high availability are achieved. WEG claim to erect as many as three wind turbines a day at the height of their installation programme. Operation and maintenance costs can represent a significant proportion of the total costs, since there are no fuel costs. In 1987, the WEG have halved the operation costs that were regarded as realistic less than a year ago.

Factory prices for wind turbines are quoted at £500/KW. Dutch and Danish suppliers are prepared to discuss even lower prices. The BWEA were able to claim such low generating costs only by considering the very best wind speeds as 9.4 m/s (21.5 miles/hr). More modest speeds are being considered now (19 miles/hr). It is now confirmed that in the United Kingdom wind energy costs are considerably cheaper than any other form of power generation (except hydro for which no sites are available). It is envisaged that 30% or more of the power needs of Britain could be met from wind energy in the not too distant future.

Although the wind is intermittent, it blows on an average far less than 40% and it is no more intermittant than the load that the power system has to meet and as such it is not considered to be a serious problem. This claim is difficult to comprehend. It is clear that the only problems now standing in the way of widespread deployment of wind power in UK are institutional and environmental. Large wind turbines are noisy especially those with the rotors to the rear. Technical solutions have been evolved. Noise is no longer regarded as a serious problem. Radio and TV interference have also been solved. All wind farms require vast stretches of basically unforested area. Visual intrusion of the landscape is being objected to by the environmentalist. One cannot seriously object to the imaginary visual intrusion from wind farms, without realising that the alternative will involve acid rain and/or nuclear radiation hazard.

The Department of Non-conventional Energy Resource (DNER) initiated the wind energy programme in 1986 by installing wind energy farms with a total capacity of about 3.3 MW in various coastal areas of India. In the first phase, the Department chose five spots in Saurashtra coast of Gujarat, East coast of Orissa and Tamil Nadu, as also the Konkan coast in Maharashtra. The sites chosen have wind speeds in excess of 16 Km/hr.

During 1986, the wind farm with a capacity of 1.1 MW, was inaugurated at Mandu in Kutch at an estimated cost of Rs. 1.70 crores. The first wind farm in Tamil Nadu comprising 20 windmills of 55 KW each have been installed by the South Arcot District of Tamil Nadu. The second phase consisting of 15 units of 90 KW each is likely to be commissioned at South Shanthaikulam village soon. In Maharashtra two stations are at Devgad in Sindhudurg district and another at Vijaydurg have been in operation for two years. India's five wind farms, with an aggregate capacity of 5.75 MW are reported to have fed 95 lakh units of electricity in the State grids during 1986-87. In a paper submitted by Tata Energy Institute, on the basis of a demonstration wind farm at Okha (267 working days per year) the levellised annual cost of generation has been computed at Rs. 1.67/KWh as against Rs. 1.33 for a thermal power station. There is ample scope for reduction in the cost of wind power generation by adopting aerogenerators of latest design

-- T.P.S. RAJAN

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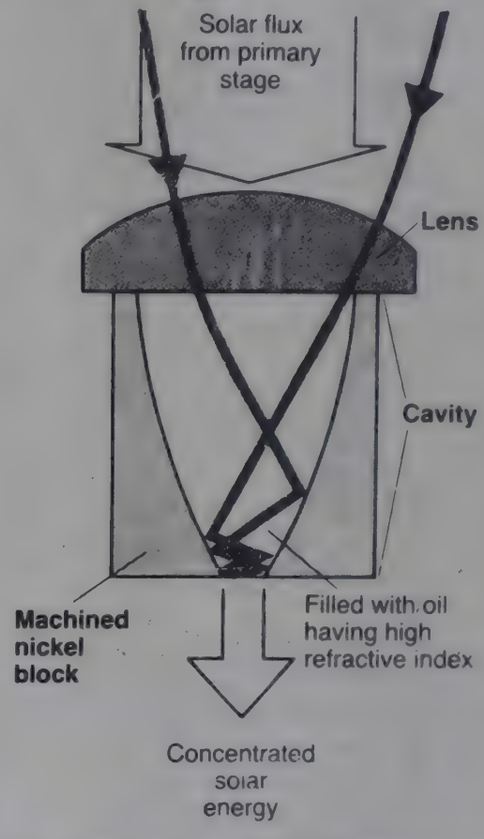
New High Intensity Solar Energy Collector

Physicists at Enviro Fermi Institute of Chicago have decised and tested a high efficiency solar energy collector-based on non-imaging optics. The device is intended as a power source of broad band solar radiation. This "Winston" collector produces broad-band energy beam 60,000 times more intense than the incident beam. It is claimed to exceed the 'thermodynamic limit' of 46,000 by the use of an immersion oil of very high refractive index in the collector.

There are two stages -- a first stage primary collector consisting of conventional refractor telescope of 16+ inches diameter that tracks the sum with a motorised drive. The second stage is placed in the vocal plane of the telescope and the collected rays of the first stage passes through a lens into a specially designed cavity filled with the special oil. The entering beams of 1 cm dia. exits at about 1 mm. and with 58% of original incident energy. The outline of the device is in Figure.

Collector concentrates solar energy



The principle used is to collect the maximum fraction of incident solar energy and not to collect fractions of the incident beam. An outlet of 6 KW per sq. cm. was obtained. This device is bound to be extremely costly due to the large machined nickel block. The main purpose could be for driving lasers in satellite and is a real breakthrough which can be used for high temperature processing of high performance materials and other areas.

Top Fifty Chemicals in U.S.A.

The annual feature on the top 50 chemicals in USA is always an index of the trends world-wide. 1987 has seen a big rise in overall production by 5.5% over 1986. Both organics and inorganics have risen with the organics higher. Exports have also helped in boosting production even though imports have also risen to a lesser extent. Organic chemicals comprise 36% of the top 50, but the inorganics have advanced more. Total organics in 1987 were 202 bill. lbs. and inorganics were 365 bill. lbs. The annual growth rate of 1977-87 was 2.5% for organics and -0.1% for inorganics with a 1.3% overall rate. In 1987, there was rise in 42 of the top 50. Overall production of 567 billion lbs. was only slightly short of the highest ever of 575 in 1979.

What is interesting is the entry of new chemicals into the top 50 and MTBE -- Methyl Tertiary Butyl Ether --jumped to 32nd from 41st with a record 3.37 bill. lbs. Caprolactam jumped a spectacular 37% to get into the 50th spot at 1.16 bill. lbs. Again fertiliser chemicals jumped after slump for some years -- urea 23%, phosphoric acid 14%, potash 13%, nitric acid 8.2%. The reduction was in ethylene oxide, glycol and sodium silicate. Carbon dioxide has been having a good year.

It is interesting to look at the present top 50 in USA (Table I) and level of production in 1987 to get at the status of Indian chemicals. The items yet to be produced in India out of this list are TPA, potash, propylene oxide,

Table I
Top 50 Chemicals

Rank 1987	Rank 1986*	Chemicals	Billions of lb. 1987	Billions of lb. 1986
1	1	Sulphuric Acid	77.49	73.64
2	2	Nitrogen	47.32	48.62
3	4	Ethylene	34.99	32.81
4	6	Ammonia	32.32	28.01
5	3	Oxygen	32.28	33.03
6	5	Lime	30.36	29.67
7	7	Sodium hydroxide	23.03	21.38
8	8	Chlorine	21.93	20.87
9	9	Phosphoric acid	20.95	18.41
10	10	Propylene	18.53	17.34
11	11	Sodium carbonate	17.78	16.88
12	14	Urea	14.86	12.06
13	13	Nitric acid	14.20	13.12
14	12	Ethylene chloride	13.81	14.53
15	15	Ammonium nitrate	12.83	11.11
16	16	Benzene	11.67	10.23
17	17	Carbon dioxide	9.84	9.77
18	18	Ethylbenzene	9.41	8.92
19	19	Vinyl chloride	8.23	8.42
20	21	Terephthalic acid	8.11	7.68
21	20	Styrene	8.09	7.84
22	22	Methanol	7.29	7.33
23	25	Toluene	6.73	5.82
24	24	Formaldehyde	6.08	5.89
25	26	Xylene	5.72	5.55
26	23	Ethylene oxide	5.62	5.94
27	27	p-Xylene	5.15	5.00
28	28	Hydrochloric acid	4.99	4.83
29	29	Ethylene glycol	4.52	4.76
30	30	Ammonium sulfate	4.37	4.17
31	31	Cumene	4.15	3.70
32	41	Methyl-tert-butyl ether	3.37	2.24
33	33	Phenol	3.24	2.92
34	32	Acetic acid	3.23	2.93
35	35	Butadiene	3.00	2.59
36	34	Potash	3.00	2.65
37	35	Carbon Black	2.72	2.59
38	37	Propylene oxide	2.61	2.48
39	39	Acrylonitrile	2.55	2.31
40	40	Vinyl acetate	2.51	2.25
41	38	Aluminium sulfate	2.45	2.44
42	42	Cyclohedane	2.25	2.07
43	43	Acetone	2.08	1.94
44	44	Titanium dioxide	1.90	1.86
45	45	Sodium silicate	1.90	1.57
46	47	Sodium sulfate	1.61	1.55
47	48	Adipic acid	1.57	1.52
48	46	Calcium chloride	1.55	1.56
49	49	Isopropyl alcohol	1.31	1.28
50	50	Caprolactam	1.16	0.85
		Total Organics	201.85	189.17
		Total Inorganics	364.83	347.74
		Grand Total	566.68	536.91

Table II
Total Polymer Production

	Billions of lb 1987	Billions of lb 1986	Average growth 77-87
PLASTICS (millions of lb)			
Thermosetting resins	**6.26**	**5.83**	**4.7%**
Phenol, other tar acid resins	2.87	2.72	7.0
Urea resins	1.38	1.27	3.7
Polyesters (unsaturated)	1.37	1.27	2.6
Epoxies (unmodified)	0.43	0.40	5.2
Melamine resins	0.21	0.17	0.6
Thermoplastic resins	**37.03**	**33.57**	**5.6**
Low-density polyethylene	9.63	8.89	4.1
PVC and copolymers	7.97	7.26	4.3
High-density polyethylene	8.00	7.17	8.2
Polystyrene	4.78	4.44	3.3
Polypropylene	6.65	5.81	9.2
Total	**43.29**	**39.40**	**5.4**
SYNTHETIC FIBERS (millions of lb)			
Cellulosics	**0.61**	**0.62**	**-3.8**
Rayon	0.41	0.40	3.6
Acetate	0.19	0.22	-4.1
Noncellulosics	**8.30**	**7.82**	**1.8**
Polyester	3.54	3.31	-0.3
Nylon	2.69	2.51	1.5
Olefins	1.48	1.38	20.2
Acrylic	0.59	0.62	-1.8
Total	**8.90**	**8.43**	**0.4**
SYNTHETIC RUBBER (thousands of metric tons)			
Styrene-butadiene	1.87	1.75	-4.8
Polybutadiene	0.82	0.74	0.3
Ethylene-Propylene	0.56	0.51	4.9
Nitrile	0.15	0.13	-0.1
Other	1.41	1.31	4.0
Total	**4.81**	**4.44**	**1.0**

adipic acid. India is yet to organise collection and publication of production data immediately after the year and often the data is incomplete besides 2 to 3 years behind schedule. The DGTD list is representative but incomplete as small scale sector is not included. A far more detailed and comprehensive information on output in quantity and value is required if we are to progress fast. To some extent the information on petrochemicals and nigrogenous fertilisers is adequate due to the public sector and limited number of large corporations. Perhaps organisations like ICMA should take a lead.

Separately the production of polymers had maintained the uptrend for the fifth year in a row to touch 26 million tonnes, 9/0% over 1986. Plastics were two-thirds of this with 10%, synthetic rubers at 7.0% and synthetic fibers 5.6%. The details of production in 1987 and 1986 of these with the average growth rate for 1977-87 is given in Table II.

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Mafatlal's Gujarat plant expansion

The government has cleared three proposals of Mafatal group for effecting substantial expansion at their Gujarat plant.

The total investment involved in these projects, mooted by Navin Fluorine Industries, chemical division of Mafatlat Fine Spinning and Manufacturing Company Limited, works out to Rs. 145 lakhs, which will be met from internal resources.

The first proposal envisages re-endorsement of highest capacity for the manufacture of sulphuric acid and oleum from 20,625 mta to 31,040 mta at a cost of Rs. 51 lakhs.

The second plan is for enhancing the existing capacity of the manufacture of synthetic cryolite, aluminium fluoride and flurocarbon gases from 10,875 mta to 17263 mta (cost Rs. 52 lakhs).

The third one seeks to increase the capacity for the manufacture of hydrofluoric acid from 7,200 mta to 1,1035 mta at a cost of Rs. 42 lakhs.

The government, in identical orders, stated that the items proposed were, covered under Appendix I entitling the large industrial houses like Mafatlals to participate in the line of manufacture. Besides, the applicant company is not a dominant company in the manufacture of items proposed. And thirdly, in all the items the company seeks to add one-third capacity to the best production figure.

In another order the government have also cleared, partially though, the proposal of the same group's Mafatlal Engineering Industries Limited for taking up the manufacture of textile machinery by amending its industrial licence.

The company's new activities will include the manufacture of spinning preparatory machinery, yarn making machines, weaving machines/knitting machines with a combined total annual capacity of 5300 number.

However, the government have said 'no' to the plea made by the company that it also be allowed to manufacture components, accessories and spares of spinning machinery, weaving machinery and processing machinery. The government's argument was these items were outside the purview of the broad-banding scheme.

GAIL's propane cracker : VAM Organic top contender

Vam Organic has emerged as the top contender for giant propane cracking plant being set up by the Gas Authority of India Ltd. (GAIL) in the joint sector.

The propane cracker will yield propylene, which will be polymerised to produce polypropylene, an important raw material for plastics and synthetics fibres. Investment in this project could be between Rs. 400 crores and Rs. 500 crores. So, if Vam Organic succeeds in tying up finally with GAIL, it will have entered the big league of industrial giants. Today it is only a medum-sized company specialising in the manufacture of vinyl acetate monomer.

The propane cracker will come up at Bijaipur on the Hazira-Bijaipur-Jagdishpur gas pipeline. This is the point at which the pipeline bifurcates. So, it is the most inland possible location for a petrochemical complex based on gas.

Apart from the propane cracker, GAIL also plans to set up a plant for extracting liquid petroleum gas at an investment of perhaps Rs. 350 crores. This is unlikely to be a joint sector project — GAIL will probably finance this entirely.

The piece de resistance of the Bijaipur petrochemical complex will be an ethane cracker with downstream facilities costing perhaps Rs. 2,000 crores. A feasibility study has been commissoned for this plant, which may not come up till 1994. But the LPG plant could be ready by 1990, and the propane cracker by 1992.

Vam Organic had sales totalling Rs. 29.85 crores in 1986-87 with a net profit of Rs. 3.5 crores. The company plans to double its produce of vinyl acetate monomer to 20,000 tonnes a year. It is also setting up a monoethylene glycol plant at a cost of Rs. 81 crores at Kashipur. It seems all set to emerge as one of the big petrochemical giants in the country.

'SHIFT TO GENERIC NAMES FOR DRUGS'

The need to list all harmful drugs in the market and ensure their withdrawal as well as to strictly monitor the prices of both essential and non-essential drugs was emphasised by Dr. Zafarullah Chaudhary, in Bombay on May 25.

Dr. Chaudhary is regarded as the architect of Bangladesh's 'essential and rational drug policy" of 1982 which succeeded in banning all harmfull drugs from the country.

At a press conference in Bombay on May 25 Dr. Chaudhary pointed out the importance of marketing drugs under their generic names rather than a particular brand. "It is impossible for doctors and consumers to remember 200 different names of the same drug and this automatically leads to misuse of drugs and uncontrolled prices," he stated.

Drugs like Streptopenicillin, mexaform and analgin continue to be marketed in India, though banned in most of the developed countries and a lax drug policy along with a lack of political will was responsible for this, Dr. Chaudhary said.

He admitted that shifting to generic names was just one step in the entire process and would not solve the problem by itself. Dr. Chaudhary said that a strong policy and a reduction in the number of drugs would help in controlling the situation.

"Irrational drug combinations" were another common feature in India, Dr. Chaudhary said. He cited the example of "Becosule" that a combination of vitamins B1, B6, and B12. "The same 'Becosule' manufactured in the UK and the US would not contain B12 as that vitamin is specific for a condition called "pernicious anaemia" or for trauma after surgery. There is also enough B12 in the liver for two years. Even when it is needed, it should be taken in the form of an injection and not orally," revealed Dr. Chaudhary.

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NEWS DIGEST

Aluminium price decontrol likely

A proposal to decontrol aluminium prices is now under the Government's consideration.

The proposal, which has been mooted in the context of the surplus developing in the availability of aluminium, is now before the Committee of Secretaries.

Prices of aluminium are fixed by the Government from time to time under the Aluminium (Control) Order, 1970, promulgated under the Essential Commodities Act.

Under the existing pricing scheme, aluminium producers are entitled to a retention price based on their cost of production and a return on net worth part of the capital employed. The sale price is fixed at weighted average of the retention prices.

The producer, whose retention price is lower than the sale price is required to pay the difference between the two prices into an account called the Aluminium Regulation Account (ARA). The producer whose retention price is higher than the sale price is entitled to get the difference from ARA.

The basic objective of this pricing policy has been to make available aluminium to the consumer at a fair price where imports have been resorted to meet some portion of the demand.

However, according to latest projections, country will have surplus from this year onwards for some years. Against last year's gap of 70,000 tonnes between demand and domestic production, the surplus in the current year is estimated at 10,000 tonnes. The projection of surplus for the next year is put at 40,000 tonnes.

NEED FOR SPECIALISTS IN QUEST FOR SUPERCOMPUTERS

A three-day national conference on supercomputers which began in Trivandrum is expected to lay down the fundamental requirements for supercomputers to be developed indigenously.

The Indian supercomputers will be using the parallel processing route to achieve the performance demanded.

As Dr. C. R. Muthukrishnan of the Indian Institute of Technology, Madras, pointed out that supercomputers were ultra-high performance systems capable of processing extremely large amounts of information very swiftly. This capability was essential in dealing with many complex problems.

Parallel Processing :

While greater speed could be got by improving the "chips" themselves, it was now accepted that the gains would be substantially more if a large number of these, working in parallel, were used rather than just one processor carrying out sequential operations. In the human brain, for instance, the slower speed of the units were compensated for by the use of such parallel processing in a big way, he observed. Dr. Muthukrishnan saw shortage of trained specialists as one of the major problems in the country's quest for its own supercomputers. While the country had people in the broad area of computer applications, there were not enough experts in specialised areas like computer architecture and software development.

Indigenous capability to design and manufacture VLSI (very large scale integrator) chips was essential for going the parallel processing route. This was so because special circuits would have to be built into them for coordinating the processing of information.

Several choices :

There were several choices available in deciding the architecture of parallel processing systems particularly in the matter of coordinating the processing of data. The choice would depend on the type of application for which the supercomputer was needed. It was quite possible that more than just one type of supercomputer would be needed to meet all the country's requirements, Dr. Muthukrishnan added.

Dr. Muthukrishnan, along with Dr. S. Nagarajan of ADE, Bangalore held tutorials on parallel architecture and computation techniques for supercomputing today.

In the technical sessions, over 50 experts from academic and research institutions will be presenting papers on supercomputing and the use to which supercomputers could be put to in India.

According to the organisers, this is the first attempt to bring computer designers, applications specialists, and user groups together to discuss the design possibilities for an indigenous supercomputer.

Specific suggestions :

A panel discussion in the concluding session is expected to formulate specific suggestions and recommendations on these aspects.

The conference, attended by over 200 delegates, is being hosted by the Trivandrum chapter of the Computer Society of India.

PARAFFIN WAX EXPORT THROUGH BALMER LAWRIE

The Union government has canalised the export of Paraffin Wax type III through the Balmer Lawrie, a public sector undertaking. Moreover, the export of Red Sanders wood in the form of powder has been permitted under open general licence (OGL) subject to certain conditions.

According to a public notice issued by the Chief Controller of Imports and Exports on May 12, Red Sanders wood in the form of chips and powder will be allowed under OGL-3 on production of certificate of origin for acquiring Red Sanders wood and accounting for the quanties consumed in the manufacture of chips and powder at the time of export.

In respect of Red Sanders wood emanating from Andhra Pradesh, certificate of origin will be issued by the chief conservator of forests, Andhra Pradesh. Certificate given by any other authority will not be accepted, it has been clarified

In the case of Red Sanders wood emanating from Tamil Nadu, certificate of origin will be issued by the chief conservator of forests, Tamil Nadu. In this case also, certificate given by any other authority will not be entertained.

PSF exports allowed

The Government has decided to allow the export of polyester staple fibre (PSF) with a ceiling of 60,000 tonnes.

The entire year's ceiling will be released in two equal instalments on an half-yearly basis. The first half of the year will be from April 1 to September 30, 1988, and the second half from October 1 to March 31, 1989.

For the purpose of licensing, the entire ceiling is placed at the disposal of the Joint Chief Controller of Imports and Exports, Bombay.

The Government has also decided to allow the export of polyester yarn (all types) during the licensing period 1988-89. But during the first half of the year, that is, April-September, 1988, exports of polyester yarn will be permitted within a limited ceiling of 2,500 tonnes on the basis of the highest unit value realisation in accordance with the procedure laid down in the current import-export policy.

It has been clarified that the unit of measurement will be in Indian rupees per kg. fob.

The Government has further decided to release the ceiling of 3,000 tonnes for export of viscose staple fibre spun yarn subject to the price of Rs. 30 per kg. in terms of export licensing procedure.

For the purpose of licensing the entire ceiling of 3000 tonnes has been distributed as follows:- Joint Chief Controller of Imports and Exports, Bombay — 1,500 tonnes and JCCI & E, Madras, the ceiling will be operated on an half-yearly basis, releasing the ceiling in two equal instalments.

The first half of the year will be from April 1 to September 30, 1988. Similarly the second half of the year will be from October 1 to March 31, 1989.

POLYESTER FIBRE EXPORT QUOTA RELEASED

The Union government has released export quotas for polyester fibre and yarn for the current year and has also decided the cash compensatory support to aid its exports, it is learnt.

At the same, the government is understood to have decided not to allow any exports of nylon filament yarns and viscose filament yarns in view of the steep rise in their prices in the domestic market.

An export quota of 60,000 tonnes of PSF has been released for the year, out of which 30,000 tonnes will be allowed to be exported during the first half of the current year and balance during the second half. The exporters will be given five per cent CCS.

In the case of PFY, the export quota of 5,000 tonnes is equally divided during first and second half of the year and CCS has been fixed at eight per cent.

NATIONAL GRID FOR NATURAL GAS MOOTED

The President of the PHD Chamber of Commerce and Industry, Mr. Manmohan Singh, has suggested establishing a national grid for natural gas to bridge the gap between crude oil demand and supply which was likely to grow by 50 to 75 million tonnes by the year 2004-05.

Suggesting a review of the policies for natural gas utilisation, Mr. Singh has underlined the need for exploring the possibility to make available the natural gas to consumers, including captive power stations on long-term commitment basis, and to keep the price of natural gas comparable to the pithead price of coal to facilitate its viable use in industry. It would encourage industry to make full use of captive power generation capacity by substituting diesel with gas.

Utilisation of gas particularly in the transport sector for vehicles was sultant benefits in terms of saving of valuable foreign exchange spent on diesel could be substantial.

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Frankly Speaking

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(An author of repute and a visiting professor, Dr. Kharbanda consults worldwide including to UNIDO)

For Want of a Rubber Seal—Disaster !

The **Challenger** disaster on 28 January 1986 is the one and only time that the whole world witnessed the sudden death of seven people in vivid detail . and they died because of mismanagement ! Not only the world at large, but the wives of the astronauts and the students of the social studies teacher who was on board were stunned to silence as they watched the incredible happen. This was the first disaster in the air in 36 manned space missions for the United States, although three astronauts had died on the launchpad in the Apollo 1 craft some seventeen years earlier. Six months later the Presidential Commission inquiry published its report and blamed the disaster on the rupture in a lower joint of the Shuttle's right Solid Rocket Booster (SRB).[1] It appears that the failure was triggered by the fact that when **Challenger** was launched the air temperature was 15 degrees lower than it had been on any previous launch.

In recommending for a new joint design that would withstand the stresses that led to the leakage of hot gases and the subsequent explosion, the 256-page report went on to make a series of recommendations, including :

* Establishment of a NASA safety office and independent review boards.
* Improved communications within NASA and the industry.

It was pointed out in the Report that the reliance on the Shuttle as a principal launch capability put relentless pressure on NASA to increase the flight rate, but of course this pressure would have been resisted had there not been serious weaknesses in the NASA management structures and quality control procedures. The Commission concluded that there was a serious flaw in the decision-making process leading up to the launch and further stated that the decision to launch was based on 'incomplete and sometimes misleading information, a conflict between engineering data and management judgements, and a NASA management structure that permitted internal flight safety problems to by-pass key Shuttle managers'. It has been clearly established that the management was at fault and two areas were particularly highlighted: safety procedures and communications. The doctrine 'safety first and always' must never be violated. The immediate lesson of the **Challenger** disaster is that safety should never be subordinated to demands

for increased output or keeping the date of a launch at any risk, an error into which the management seemed to have tripped into.

With respect to effective communication within the management structure, there is no doubt that its importance is well recognised. Unfortunately it is also asserted that it is largely absent. The management Guru, Peter Drucker, whose reputation in management circles is such that we never dare ignore what he says, asserts in a foreword to a book on the subject of management communication, that the great majority of us do not know what to say, how to say it, nor to whom to say it.[2] But that is not the only hurdle. Listening is an integral part of communication and though a vital skill it is rarely taught. The result: the average listening efficiency is said to be a mere 20 per cent. We spend our waking hours 'hearing things', but we do not necessarily **listen** to what we hear. And this can make all the difference !

There are two basic ways of communication : by word of mouth and in writing. When we say something the recipient of the message has to listen. Research has however established that attention to the speaker is dependent both upon the length of message and its quality. If we assume an even quality of delivery, attention falls off very rapidly after some 10 minutes. However, if the speaker creates new interest, either by change of subject, change in tone of voice, or some other device, then interest and 'listening' can be reawakened. It seems that similar considerations apply to the written message. That too must be short and precise if it is to be effective. It appears, for instance, that Proctor and Gamble have a long-established tradition that a memo should never run to more than one page. This started with a past president, Richard Deupree, who would return a long memo to the sender with the comment: 'Boil it down to something I can grasp'. The tradition still lives within the company, for it was only recently that one of their managers confided:[3]

> . . . I just submitted a set of recommendations . . . it ran to a page and a quarter and got kicked back. It was too long !

So once again we have a lesson for all our readers, not only the managers amongst them. It is clear and concise and it is to be hoped that they will heed it: Those who wish to communicate should keep the message terse and clear, whilst those who receive the message **must** listen. Indeed, encouraging people to listen is such a vital element in effective management that we once devoted a whole chapter to the subject (The project manager really must listen) in a book dealing with project management.

1. Shuttle Inquiry — Commission urges major changes', **Spaceflight**, Vol. 28, July/August 1986, p. 292.

2. Parkinson, C. N. and N. Rowe, **Communicate: Parkinson's Formula for Business Survival**, Prentice-Hall, 1977.

3. Peters, T. J. and R. H. Waterman, **In Search of Excellence: Lessons from America's Best-Run Companies**, Harper & Row, New York, 1982.

4. Stallworthy, E. A. and O. P. Kharbanda, **Total Project Management**, Gower, 1983.

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Fertiliser glut due to import lobby : study

The planners have unwittingly played into the hands of the fertiliser import lobby in projecting heavy forecasts for import of fertilisers in the Seventh Plan, according to a study.

The planners have forecast average import of fertilisers worth Rs. 2,600 crores annually in the Seventh Plan.

The study on "India's trade deficit and the role of foreign aid" done by Mr. B.P. Mathur, member, Audit Board and ex-officio director of commercial audit, Bombay, has been carried in "Foreign Trade Review", a quarterly journal of the Indian Institute of Foreign Trade.

The study says it was the aid and import lobby which was responsible for pushing unnecessary fertilisers into the country, causing a glut situation and wastage of foreign exchange. "It is not realised that outlays indicated in the Plan document become a kind of 'sanction' or 'authority' and not often the concerned departments go in for a spending spree without reassessing the actual requirements", the author says.

The author says India produced in 1984-85 more than 5.2 million tonnes of fertiliser in terms of nutrients. It has a burgeoning fertiliser industry and the Planning Commission's import forecasts were highly exaggerated. The fertiliser stock position in May 1986 was a staggering 16.06 lakh tonnes, creating an unprecedented glut in the indigenous fertiliser industry.

The author says the Union Government audit report had examined the problem in depth and noted that the Ministry of Agriculture in its import plan for 1981-82 and 1982-83 had decided to have a buffer stock as on February 1, 1982 and 1983 of 9.90 lakh tonnes and 10.23 lakh tonnes respectively. Against this, the buffer stock as on February 1, 1982 and 1983 was 16.53 lakh tonnes and 16.82 lakh tonnes of nutrients respectively, resulting in excess import of 6.63 lakh tonnes during 1981-82, and 82-83 and causing a loss to the country of Rs. 391.86 crores in foreign exchange.

The author says, similarly, diammonium phosphate to the tune of Rs. 391.86 crores was imported in 1981-82 in excess of need, costing the country another Rs. 155 crores in foreign exchange.

Mr. Mathur says heavy imports are taking place, as the Seventh Plan itself has projected an abormally high outlay of Rs. 95.437 crores in disregard of the country's ability to pay in terms of its exports (Rs. 60,665 crores). Thus the tragedy of India's trade deficit (to the extent of Rs. 7,000 crores annually) is written in the Seventh Plan document itself, it says.

The author says the country has been making an error of judgement in visualising 'external assistance: as a resource for the Plan much in the same way as a 'domestic resource' (through taxation and mobilised savings). It must be realised, the author says, that 'external assistance' and 'domestic resource' cannot be substituted. Foreign aid has an exploitative element with all its attendant transfer problems and by the time it reaches the recipient its real value is only a fraction of its face value. 'Therefore, it is time we drastically cut down the size of external borrowing and depend on our own resources to finance our economic development, which would inter alia also help contain on massive trade deficits' Mr. Mathur says.

CRUDE OIL TARGET EXCEEDED

Indian Oil's Guwahati refinery, the first public sector refinery, has achieved over 100 per cent target for processing crude oil for the second consecutive year in 1987-88. The refinery has processed 0.815 million tonnes of Assam crude in 1987-88 as against 0.802 million tonnes in 1986-87, compared to a target of 0.80 million tonnes set for both the years by the oil economy budget (OEB). The refinery has thus achieved 101.9 per cent of its target in 1987-88, improving its achievement of 1.7 per cent in the previous year.

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Drugs price revision : BICP work on

The Bureau of Industrial Costs and Prices (BICP) has begun work on upward revision of prices of more than 130 price-controlled bulk drugs.

A BICP team is now in Bombay for an on-the-spot examination and verification of cost data submitted by City-based pharmaceutical units. It has been entrusted with the task of revising the prices of bulk drugs coming under price control and evolving a formula to ensure automatic increase in prices to absorb rising costs.

With this, the halting and tortuous implementation of the Drug Prices Control Order (DPCO) announced in August last year has received another push.

The prices of some 20 bulk drugs, most of them manufactured by public sector units, have already been revised. The current exercise to revise prices of the remaining bulk drugs is expected to take two to three months. There are in all 166 price-controlled bulk drugs: 27 under category I for formulations required for the national health programmes and 139 under category II.

The industry had been asked to reply to lengthy questionnaries on cost data which some companies saw as a ploy to delay price revision. Now that Parliament is not in session, the price revision exercise is being expedited, they feel.

However, according to the BICP Chairman, Dr. Vijay Kelkar, not all companies have submitted the cost data in time.

Addressing the annual general meeting of the Organisation of Pharmaceutical Producers of India (OPPI) in Bombay last month, he said that companies which do not submit the cost data in time would be treated as the most cost-efficient. The prices of such units would be based on the old cost data submitted in 1977 or the lowest costs submitted by others, whichever is lower he said.

The Government has also belatedly begun upward revision of category I and II formulations prices based on the 1977 costs. This was to have been an interim measure immediately following the announcement of the 1987 DPCO. However, wherever formulation prices were to be reduced, this was done with alacrity, industry sources say.

Meanwhile, the industry is awaiting the Government's notification of the revised packing and conversion norms. The norms as currently being followed are based on 1974 data and are grossly unrealistic following the steep increase in wages and power tariffs.

The Sankaran Committee submitted its recommendations on revised packing and conversion norms in April end. After the Government notifies the new norms, the industry has to apply afresh to get its formulation prices again revised. Once this is done, future adjustments in prices could hopefully be done at the departmental level.

Some in the industry feel that the whole exercise is being deliberately staggered and delayed for fear of a hefty one-time increase in prices arousing the public ire.

SANDOZ TO TAKE UP NEW PROJECTS

Sandoz India Ltd., will be undertaking a few new projects in the coming years in the fields of pharmaceuticals and speciality chemicals, according to Mr. J.P. Hayoz, managing director. In the pharmaceuticals, the company will be taking up the manufacture of thioridazine, and pindolol, two bulk drugs. The company has already received letters of intent for these two drugs.

The company has also received letters of intent for the manufacture of oilfields chemicals and speciality leather chemicals. Both have a steadily increasing demand in the country today.

Talking to shareholders at the annual meeting in Bombay recently, Mr. Hayoz said the project for the manufacture of sulphamethoxazole, an important bulk drug, was progressing as per schedule.

The new plants for the manufacture of agrochemicals intermediates and leather chemicals at Panoli in Gujarat were completed. Trial production was achieved in December 1987 and the commercial production commenced this year. Mr. Hayoz said the turnover of the company during the first four months of the current year was higher by 11 per cent at Rs. 31.3 crores as compared to the same period of the previous year. The agrochemicals division has been particularly successful followed by the chemicals division.

The pharmaceuticals division still continues to make losses mainly because of slow implementation of price revisions.

On the export front, the company has received orders worth more than Rs. 13 crores. About 10 per cent of these export orders have been already executed.

BANNED DRUG COMBINATION STILL IN USE

Nearly Rs. 8-crore worth of a hazardous drug combination continues to be sold in India, despite its withdrawal worldwide.

The drug 'high dose' Estrogen-Progsterone is used for pregnancy and abortion tests, according to the Voluntary Health Association of India.

"The use of this drug is known to cause malformation of the unborn child but its sale in India is unhindered and its ban long overdue", the association said.

Firms throughout the world have stopped production of these drugs, banned in several countries because of strong medical opinion.

In India, the drug combination was banned by the Drugs Controller in June, 1982, but three drug firms went to court and obtained a stay order.

In November, 1986, the Supreme Court ordered the Drugs Controller to give its verdict after holding public hearings to obtain the views of consumers and the medical community.

Four public hearings were held, at which arguments for and against the use of the high dose E.P. drugs were presented. The deadline for the verdict expired in December last year, after the Drugs Controller obtained a six months' extension in July.

The Indian Council of Medical Research (ICMR) Expert Committee said high dose E.P. drugs should be banned immediately as their harmful effects were well documented.

The Drug Technical Advisory Board also recommended the same course of action.

Warning ignored : pesticide formulators

In response to reports appearing n certain sections of the press regarding the problem experienced by Farmere in Andhra Predesh with regard to usage of synthetic pyrethroids, the secretary to the Pesticides Formulators Association, Shri Pradeep Dave has issued the following clarification :

"This refers to Mr. V.G. Prasad Rao's articles (Feb. 22/23 and 23/24) "Crime rate up in drought-hit Guntur", and "Spate of suicides by A.P. Farmers". In them, the entire blame is put on pesticide manufacturers. This is false. Our association, which represents 180 formulators throughout India, is as concerned as the Government and its agencies about the plant protection problems faced by farmers in our country, and more so by the cotton growers in A.P. during the 1987 season.

"Any manufacture, sale, stock and distribution of pesticides is governed by the insecticides act, 1968, which is more stringent than that which governs the drugs trade. Every formulator must obtain registration from the central insecticides board and registration committee prior to the manufacture of each pesticide formulation. Subsequently, state departments of agriculture issue licences to manufacturing, after considering the manufacturing and quality control facilities. Furthermore, the products are monitored by the state's quality control inspectors and analysts before these reach the consumer.

"The present situation in A.P. has come about due to the injudicious use of pesticides, and particularly of synthetic pyrethroids, the fourth-generation pesticides. Prior to the introduction of pyrethroids in our country, it was known that pests had built resistance to them elsewhere in the world. The authorities were thus very cautious in registering these products. A national conference was held exclusively on this during Septem, 1980 in Nagpur where agricultural scientists eloquently deciphered the usefulness of the new pesticides, their side effects and their impact on natural parasites and predators resulting in occurrence of pests like green hoppers, white flies, etc. Therefore, a warning was then sounded that pyrethroids should be used with caution to control cotton bollwors and they should be interspersed with conventional pesticides that have been in use for a decade.

"However, the government agencies failed to communicate the real nature of pyrothroids and the need for their judicious use to farmers. This has resulted in the present predicament. Two years after the introduction of pyrethroids, warning signals came with the emergence of white flies, which had been confined to Punjab and Haryana earlier.

"Whereas synthetic pyrethroids are being used all over India, why has this problem arisen only in Andhra Pradesh? This is because in other states like Maharashtra, Kerala, Karnataka, Tamil Nadu, Punjab & Haryana, the governments have separate cells in the agriculture department called TNV (Training and Visit) staffed by plant protection officers who train and teach farmers the techniques involved in the use of pesticides. This should have been followed in A.P., too, but apparently was not done. Therefore, it is not the spurious pesticides that are the culprits in the present situation".

A 'SAFE' INSECTICIDE

A new insecticide, effective against pests on rice, sugarcane, cole crops and vegetables, has been introduced by Coromandal Indag. The pesticide, Padan, is safe, as it is non-toxic to human beings, livestock, fish and birds, according to Mr. James Fredrick, Chairman of Coromandal Indag group of companies.

"Padan is developed by the Japanese company Takeda Chemical Industries, and it is a product resembling a naturally occurring insecticidal compound in marine segmented worms. It will be useful to control insects, which have developed resistance to other insecticides," said Mr. Fredrick at a press conference. The product will be manufactured by Coromandel Indag at their factory in Cuddalore.

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BHOPAL GAS CASE CLAIM

SC panel members call for increase

The two non-official members of the Supreme Court committee on the Bhopal gas victims have called for an upward revision of the Rs. 3,900 crores claim filed by the government in a court in Bhopal.

The two members' minority interim report on "sodium thiosulphate therapy of the Bhopal gas victims", released to the press makes 24 recommendations which include filing of a claim for punitive damages from the Union Carbide for misleading the government and the gas victims about methyl isocynate's prolonged toxic effect on the exposed population.

The minority report was submitted to the Supreme Court on May 11 by the two non-official members from the voluntary sector — Dr. Anil Sadgopal from the Kishore Bharati group and Dr. Sujit K Dass of Drug Action Forum, West Bengal.

The Supreme Court had appointed a seven-member expert committee in November, 1985, for recommending measures for medical relief for the gas victims and bases for determining compensation to them.

The minority report also criticised the five official members' report submitted last year for being a "public relations exercise" which praised the government for providing an "adequate supply of antidote to the gas affected population".

The majority report made an "arbitrary and unscientific" recommendation of sodium thiosulphate therapy for only those excreting "more than one per cent mg. of thiocyanate", the report alleged.

It also criticised the majority report for its "patchwork analysis" which amounted to "a denial of therapy to thousands of symptomatic gas victims".

The seven-member experts committee was divided over the prescription of sodium thiosulphate therapy for the gas victims. The non-official members said the official members' therapy was based on misleading data.

The report castigated the government for "its poor performance" and said only two per cent of the gas victims were treated by the government.

The report cautioned the government not to go by the existing medical parametres for examining the claims of 540,000 gas victims as they were "faulty and unscientific".

Capexil seeds ry freight subsidy

Representatives of the Chemicals and Allied Products Export Promotion Council (CAPEXIL) have urged the Union government to grant railway freight subsidy as the units in the northern zone are located far away from the major ports. Moreover, they have demanded an increase in cash compensatory support (CCS) so that exports could be stepped up in the coming years.

Mr. Ravi Sawhney, joint secretary, ministry of commerce, said that claims for higher CCS would have to be supported by cost data. While agreeing to get their demands examined, he asked the council to ensure atleast an increase of 20 per cent in exports in 1988-89.

In response to exporters" queries, he stated that steps would be taken to improve infrastructural facilities at the inland cargo depot in Delhi. The exporters pointed out earlier that as a result of the delay in loading, they often find it difficult to stick to the delivery schedules much to the chagrin of buyers abroad.

Mr. Sawhney wanted to know the response of the council in detail to the new measures and concessions announced in the Union budget for 1988-89 and in the new import-export policy.

The Council representatives underlined the need for strengthening commercial wings of Indian High Commissions and embassies abroad so that exporters could be properly guided.

Moreover, it was demanded that the EXIM bank scheme for medium-term export credit/finance should be enlarged to cover select products like industrial rubber products including beltings and hoses, books and publications, sanitaryware and tiles.

The government was also urged to "compensate" the tyre industry to enable it to sustain the export market, particularly because imports of tyres have been placed under Open General Licence (OGL) in the new trade policy.

The exporters said that the eligibility criteria for the furnace oil subsidy scheme should be lowered from 25 per cent of furnace oil cost input to 15 per cent of FOB value.

Mr. K.K. Bhatia, chairman of CAPEXIL, said that the export target for 1988-89 has been fixed at Rs. 510 crores of actual export of Rs. 425 crores in 1987-88.

SECOND MAJOR OIL FIND IN CACHAR

The Oil and Natural Gas Commission (ONGC) has struck crude oil about 1,318 metres below the soil at its Masimpur rig in Assam's Cachar district, an ONGC press release said.

Describing it as the second major oil find in Cachar, the ONGC said the district was a potential oil bearing area.

The commission has already struck a rich reservoir of crude in Panchgram structure, 25 gm from in Silchar.

A group of Polish engineers assisting the ONGC experts in further exploratory works in the Masimpur structure.

Senior officials from the eastern headquarters of the ONGC at Nazira in upper Assam, including the general manager (drilling), have visited Masimpur.

The crude samples from this structure have been rushed to the ONGC headquarters for data analysis.

DISTRIBUTION OF PVC RESIN, POLYETHYLENE

NOCIL, PIL may be approached

National Organic Chemical Industries Ltd., (NOCIL) and Polyolefins Industries Ltd., (PIL), two private companies, may be asked to distribute PVC resin and high density polyethylene, commodity plastics which are in short supply, it is learnt.

The Government's move is to curb the steady uptrend in prices of most of the commodity plastics in the local and international markets. Although all the basic plastics are allowed to be imported under OGL, only large units and traders are able to import them directly as almost 90 per cent of the processing units are small.

Informed sources said the govenment had decided to entrust the distribution of imported hdPE to PIL, the only manufacturer of hdPE in the country.

PIL is currently producing about 40,000 tonnes of hdPE whereas the country's demand is placed at 140,000 tonnes.

It is understood that the government may allow a pooled pricing for the material in the context of the wide disparity in the indigenous price and local market price for the imported material.

In the case of PVC resin, the government may ask Nocil to handle the distribution of imported PVC. Nocil is one of the two leading producers of PVC in the country.

It is estimated that the current deficit in PVC in the country is about 120,000 tonnes. The market price for this material is nearly Rs. 4,000 higher than the indigenous price.

Imported low density polyethylene and linear low density polyethylene are being distributed by Indian Petrochemicals Corporation Ltd., since IPCL is the only manufacturer of ldPE in the country. IPCL produces 80,000 tonnes of ldPE per annum as against the country's total requirement of 180,000 tonnes.

Meanwhile, the government has sent a high level team comprising of officials from the Union industry and finance ministries and representatives from the plastic industry to Europe and the Gulf region to explore the possibilities of procuring these materials in the context of worldwide shortage.

Thus, a quantity of 35,000 tonnes of various materials were booked by the State Trading Corporation mainly from Sabic of Saudi Arabia. These materials are expected to arrive shortly.

MALLYAS REPLACE PARTNER IN MANALI PROJECT

The industrial house of Mallyas (United Breweries) has replaced Mr. Syed Yusuff as the private sector partner in the Kamar Petrochemicals and Plastics Limited which is to implement a Rs. 70-crore project at Manali near Madras for the manufacture of three important petro-chemicals in the joint sector.

The Mallyas, accepting an invitation from the Tamilnadu Industrial Development Co. (Tidco) has become the dominant private sector partner of the project with an investment of Rs. 5.83 crores out of a total equity of Rs. 23.33 crores. Mr. S.H. Sayeed Yusuf, a businessman from Madras city, who holds licence for the manufacture of polyols, propylene glycols and propylene oxide, will be an associate in the project with his stake being less than one per cent.

The project will have technical tie-up with the leading Swiss company, Press Industria, for polyols and propylene glycols and with Montedison Italy for propylene oxide. The project will manufacture 12,000 tonnes of polyols per annum, 7000 tonnes of propylene glycols per year and 8000 tonnes propylene oxide per year. The raw material will be supplied by Madras Refineries Limited.

The Italian firm will have a financial stake of ten per cent and the share of the public will be 39 per cent the project will have Rs. 40.24 crores as term loans of which the foreign currency component will be about Rs. 6.43 crores.

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New strategy to boost exports under way

Introduction of a limited foreign exchange market, a one-stop scheme for availing export incentives, liberalisation of FERA and increased export credit guarantee cover are among the measures being examined by the Government as part of a new strategy to boost exports.

The strategy, based on a discussion paper prepared by the Planning Commission, was considered in New Delhi recently at a high-level inter-ministerial meeting.

The main idea behind the new strategy is to push the level of exports to 10 per cent of the GNP by the end of the Eighth Plan which means achieving a real growth rate of exports of 15 per cent per year.

It is pointed out that to make a successful surge in exports. it would be necessary to achieve co-ordination of the different components of policy and to improve the mechanism for granting the existing export incentives.

Given the highly restrictive nature of the present import regime, a suggestion has been made for introduction of a measure of market criteria in the availability of foreign exchange and its price for imported inputs.

It is proposed to allow exporters retain a certain proportion of foreign exchange earned from their export, say 10 to 25 per cent, in addition to the existing scheme which allows foreign exchange retention for business travel and market development.

The retained foreign exchange may be allowed to be transformed into foreign exchange certificates (Forecerts) which would be made freely tradable to manufacturers who can import inputs according to the prevailing import export policy but who are not eligible for normal foreign exchange allocations. The Forecerts can be bought for purchase of the permissible imported items.

It is suggested that exporters may also be allowed to use their foreign currency accounts for their own permissible import needs.

These measures will effectively create a parallel though limited market in foreign exchange where the exchange rate would be higher than the controlled rate.

The policy would essentially amount to a multiple exchange rate regime and would be a variation on the Rep scheme with greater flexibility.

To begin with, it is proposed the scheme may be tried for at least certain industries which are considered less essential. Luxury consumer durables such as automobiles and consumer electronics are examples of the industries that may be covered by the scheme.

Exporters will get a subsidy through the profits made on sale of Forecerts. They will also save on transaction costs for their import needs by the use of their foreign currency accounts, including savings on possible losses that currently occur because of exchange rate movements.

The foreign exchange allocation to the buyers of Forecerts would be on the basis of markets and the prices of the listed luxury goods would rise. In the process, export promotion as well as allocation of domestic resources would improve.

A new one-stop scheme, which would enable exporters to avail themselves of all export incentives through their commercial bank, has also been proposed. Once a foreign letter of credit is opened in a commercial bank, the bank would extend full credit to the exporters to import all the necessary inputs permissible under the current policy or, alternatively, to buy them from domestic sources. This credit would include the outlays necessary for all the associated customs, excise and any other indirect taxes. A list of input co-efficients would be worked out to provide the correct amount of credit to the exporters.

To ensure that the facility does not result in any discrimination against domestic suppliers to inputs, the incentives would be made available to the exporters regardless of the source of these inputs, domestic or foreign.

To start with, six commercial banks may be selected for this operation which would be concentrated in selected important branches. Also, initially, the scheme may be restricted to a few selected items of final exports like garments. leather goods, and some engineering products. The system could be made optional but progressively expanded as experience is gained.

Among the changes suggested in the Foreign Exchange Regulation Act (FERA) is to allow the operation of foreign trading organisations in India for procurement of manufactured goods for export to other countries. It is pointed out the Japanese trading houses are aggressively looking for products that can be sourced in other countries and sold under their trade names to maintain their market share in third countries. Under the pressure of high value yen, they are also looking for products that can be imported into Japan.

Such a policy would have three main advantages for India. First, quality upgradation and certification of export products. Secondly, penetration of market not otherwise available. Thirdly, technical assistance in market development.

It is also proposed to allow Indian trading houses to operate profit centres abroad by entering into trading activities with inputs sourced abroad.

Liberalisation of FERA policy on the treatment of bad debts and on treatment of export samples has also been suggested. Introduction of greater flexibility to enable the signing of contracts and changes in terms that may be highly necessary for active exporting have also been recommended.

It is felt that the changes in FERA itself may not be required so much. The implementation of FERA could be made much more automatic by reducing the necessity of references to the Reserve Bank of India for every transaction.

Indian small scale chemical industries association: membership appeal

'Dear Friend:

The Indian Small Scale Chemical Industries Association aims at promoting and protecting the interests of the chemical industry in the small scale sector by studying its problems and difficulties and trying to get them solved through representation to the authorities.

The association closely follows the legislative, executive and other actions of the Central and State Governments as well as local authorities and urges or opposes legislative and executive measures and trys to bring about changes in laws and practices affecting the industry.

Very recently, representations to the Ministry of Industry as regards shortage of some raw materials — Concentrated Nitric Acid and Benzene — have met with success.

Difficulties relating to other raw materials required in the manufacture of products intended for home market or export market, or any other matter affecting the industry, are planned to be taken up with the authorities concerned, as and when necessary.

The association is represented in the Customs Advisory Committee and Import-Export Advisory Committee (Western Zone) and Bureau of Indian Standards, formerly the I.S.I. Efforts are progressing to secure representation in some other Committees as well, including Central Excise, since these bodies act as suitable platforms to express views and thus promote the interests of the small scale sector in general and of members in particular.

Export promotion has a very important place in the association's work. By keeping in touch with embassies and trade missions of various countries any information received will be circulated among members.

Through regular circulars, members are to kept posted on all relevant subjects.

To encourage mutual contacts and spread information, the association intends to organise seminars, conferences, exhibitions, lectures, study classes etc. Establishment of museums, libraries, research institutions and analytical laboratories are also being considered.

For more details contact: Indian Small Scale Chemical Industries Association, 909, Raheja Centre, Nariman Point, Bombay-400 021. Phones: 244626/243939.

Please furnish us with information, as precisely and as elaborately as possible, on the enclosed forms, which will enable as to submit information to authorities, when necessary. We have also in mind compilation of a directory of industrial units in the small scale sector.

Please respond to this call and become a member and get involved in our work."

GOVERNMENT URGED TO REVIEW POLICY ON PACKAGING

Shri Anil B. Goradia, President, AIPMA has issued the following statemment to the press:

"With the vacation of stays granted by different High Courts on the operation of the Jute packaging Mandatory Order by the Supreme Court on May 10, the condition of hdPE units already in great difficulty has further worsened. It appears they are now doomed. It is suprising that though the Government's proclaimed objective is to help the packaging materials manufacturing industry to grow and play an important role both in the internal market and exports, the policy adopted by the Government goes counter to these very objectives. The Government has been from time to time imposing restrictions on certain categories of packaging materials and thereby stifling the growth of the packaging industry and particularly plastics industry. The plastic packaging materials have become popular because of their inherent advantages being light weight, pilfer proof, resistant to rust and better strength compared to other packaging materials. The use of plastics containers and films for milk pouch has been growing and consumers have been showing preference for the usage of these types of packing materials."

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Phone : 2938

IFFCO plant goes on stream

The Aonla plant of the Indian Farmers Fertilizer Co-operative (IFFCO) has gone on stream with the production of ammonia and urea. Commercial production is expected to begin in three months. This was announced in New Delhi on May 25 by the IFFCO Chairman, Mr. Ghanshyam Singh.

Situated in Uttar Pradesh, the Rs. 696-crore gas-based fertilizer project has been completed within the scheduled period of 36 months from the zero date and production started within 40 months. This was a record in itself, the chairman said.

The project was partly financed by the Japanese Overseas Economic Cooperation fund (OECF) and the World Bank, the foreign exchange component being Rs. 340 crores.

The main consultant contractor for the project was Snamprogetti of Italy which also supplied the know-how for the urea plant, while the know-how for the ammonia plant came from Haldor Topsoe of Denmark. The main Indian consultant was Projects and Development India Limited (PDIL) with a technology transfer arrangement with the main consultant.

The plant is expected to produce around 7.26 lakh tonnes of urea in two streams at the rate of 1,000 tonnes of urea a day. The ammonia plant has a production capacity of 1,350 tonnes a day. The project is equipped with two gas turbine generation sets which can produce around 18 MW of power to cater to the requirement of the project. If required, the project can also feed the State electricity board power grid, Mr. Singh said. With the Aonla plant, the total production capacity of IFFCO will go up to around 25 lakh tonnes of fertilizers, making it one of the leading manufacturers in the country.

ONGC THRUST TO ACTIVITIES IN E. REGION

The Oil and Natural Gas Commission (ONGC) Chairman, Col. S.P. Wahi, has said that ONGC has given a new thrust to production and exploration activities in the eastern region comprising Assam, Nagaland, Meghalaya and Tripura.

Col. Wahi, who was addressing a press conference at Najira said recently that Demalgaon and Badarpur have emerged as two most prospective oil-producing places. ONGC has fixed a production target of 3.1 million tonnes of crude oil from the Eastern region oil fields in the current year as against 2.74 million tonnes in 1987-88; resulting in a net saving of foreign exchange worth Rs. 620 crores, he said.

He disclosed that ONGC will invest Rs. 1600 crores in the current financial year in this region.

Col. Wahi also said it is one of the remarkable achievements in the region that 81 per cent of natural gas produced in the region's oil fields is properly utilised. During 1987-88, ONGC supplied 332.04 million cubic metres of natural gas to various consumers like the State Electricity Board, HFC and various upper Assam tea gardens against 12 million cubic metres of natural gas supplied in the previous year.

STEROID FORMULATIONS MUST HAVE WARNING LABELS

"Indiscriminate and prolonged use of ophthalmic formulations containing corticosteroids may lead to glaucoma, cataract and fungal infections." This warning should now be given in the package insert or on the label of steriod preparations by manufacturers.

The Central Drug Controller has written to the State drug authorities saying that there are many manufacturers of ophthalmic formulations who market corticosteroid preparations. But they do not give the necessary warnings on adverse reactions and side effects that may occur due to prolonged use of steroid formulations. These formulations can be obtained over the counter at drug stores without a doctor's prescription.

Stating that a doctor recently filed a case in the Rajasthan High Court to safeguard consumers, the Drug Controller has advised State authorities to insist that manufacturers give the warning in the package insert and other promotional literature to caution doctors and, thereby, the consumer, on the dangers of the drug. In case the manufacturer does not give a package insert along with the product he should be asked to print the warning on the label.

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New Products & Processes

NEW MICRONUTRIENTS DEVELOPED

Ekta Corporation, a Bombay based Co. has developed pure chelated micronutrients of Zinc, Ferric, Manganese, Magnesium, Copper etc. for the first time in India.

These chelated plant micronutrients are widely used in developed countries to enhance the crop yield and to reap a rich harvest at a very nominal cost compared to the profit.

The Chelekta brand products are highly stable compounds used for correction and prevention of trace metal (eg. Zinc, Ferric, Magnesium, Manganese, Copper etc.) deficiency in agriculture and are easily absorbed by plants. They are compatible with the majority of pesticides and fertilisers in common use and are completely soluble in water. This removes the problem of spraying a field in two separate operations and saves the money.

Moreover inorganic salts like Zinc Sulphate, Ferrous Sulphate, etc. are also likely to produce crop scorch and as a result may severely effect a plant development. This can be prevented by using Chelekta micronutrients.

"Chelekta" Brand micronutrients are highly recommended for all types of crops, fruits, such as wheat, rice, maize, oats, barley, sugar beet, beans vines, cotton, potatoes, onions, oil seed rape, citrus, top fruits, tobacco, tea, vegetables, flowers.

For further details, you may contact the manufacturer at the below mentioned address:

M/s. Ekta Corporation, 1/9, Darshan Udyog Bhavan, Safed Pul, Kurla Andheri Road, Bombay-400 072. Phones: 6365741/6326202.

FIRE RESISTANT HYDRAULIC FLUID

Fire has long been a major hazard wherever heat and oil work in close proximity. Houghton Hardcastle (India) Ltd., in collaboration with E.F. Houghton & Co., leading manufs. of hydraulic fluids, now offer a solution in Houghto-Safe 620, a water glycol-based, fire-resistant hydraulic fluid. Houghto-Safe 620 is wear-resistant, corrosion-resistant and lubricant. Since it vaporizes but does not ignite in cases of fire, it is ideal for use in coal mines, steel mills, foundries, die-casting machines, off-shore oil drilling units, metal working units and plastic-injection and blow-moulding machines.

An added advantage is that its vivid colour makes leaks easy to detect.

Easy, cost-free maintenance is another plus, as Houghto-Safe 620 only needs occasional topping with distilled or de-ionised water.

For further details contact Houghton Hardcastle (India) Ltd., 87, Veer Nariman Road, Bombay-400 020.

EFFECTIVE PAINT REMOVAL METHOD

An effective paint removal method, which is also free from unhealthy emissions, has been developed by AGA Gas AB in Sunbyberg, outside Stockholm.

The method is particularly applicable for the automotive industry. The paint applicators to be cleaned are placed in a tailor-made rig and transported on a conveyor-belt to a cryogenic container filled with liquid nitrogen. Approximately 0.5 — 0.7 kg liquid nitrogen is required for each kilo of articles to be cleaned.

After a few minutes the cooled tools and the brittle layers of paint brittle are blasted away with a shot-blast machine to which they are automatically transported. The difference in heat expansion coefficients for steel in the core and paint on the surface makes the process possible. Finally, the tools are heated in a furnace and restored to room temperature. The whole work-cycle takes a few minutes.

NEW ORGANIC HEAT TRANSFER AGENTS

The All-Union Research Institute of Organic Synthesis in Moscow has developed and introduced new types of universal organic heat-transfer agents that by-pass in performance the best foreign specimens.

Heat-transfer agents serve to transfer heat from one body or media

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to another in chemistry and petrochemistry — to heat reactors, fractioning and refining columns; in civil engineering: in motor transport —to cool internal combustion engines; and in nuclear power engineering.

The Institute's laboratory of chemical physics developed high-temperature organic heat-transfer agents, called Alotherm-1 and Thermolan-1, that by-pass the world's best French and West German agents in resistance to tarring and coke-formation.

This is a very important property, because coke lowers the heat-transfer capacity and this leads to further coke buildup on the surface. This is a progressing process capable of eventually crippling the entire cooling system.

Alotherm-1 and Thermolan-1 intensify the process of heat transfer from the walls of a heating element. This rules out overheating. The range of operating temperatures is rather wide and amounts to — 20°C through + 350°C for Alotherm-1 and — 30°C through 370°C for Thermolan-1. The new Soviet heat-transfer agents have much higher flash and boiling points than any foreign-made agent. The flash point is about 240°C and the boiling point 450 to 500°C.

The Soviet heat-transfer agents have great heat conductivity and insignificant viscosity comparable to spindle oil. They are chemically inert, scentless and ecologically safe.

Particularly tough requirements are produced to heat-transfer agents in use at nuclear power plants for cooling fuel elements. They should be immune to radiation. Thermolan-1 is highly resistant to radiation, and in its other characteristics it is superior to any other known organic heat-transfer agent.

ASHES AS BUILDING MATERIAL

A research team at the Department of Construction Materials and Material Testing at the University of Innsbruck in Tyrol (Austria) has invented a new type of recycling plant for ashes. Known as an activator, it can process up to five tonnes of slag or ashes per hour, converting them into an extremely durable and low-cost building material.

According to the Innsbruck scientists, the bricks and sheets produced by the activator would constitute a ideal, money-saving construction material for industrial building projects.

FOREST-SAVING GLUE

Australian scientists have developed a phenolic adhesive binder, or glue, which may help save rainforests. The glue will allow the timber industry to make high-strength plywood from dense wood — such as gum-tree wood — for the first time. Until recently, almost all Australian plywood was made from rainforest trees because of their superior ability to be peeled into bonded layers.

The glue was made by Mr. Peter Collins, an adhesives expert with Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) division of building research.

GENE DISCOVERY MAY OPEN NEW AVENUES

The recent discovery in Britain of a gene present in both yeast and human cells that is crucially important in controlling cell reproduction, may have implications beyond cancer therapy in other areas of medicine and in veterinary and agricultural science.

The technique used in the discovery involves creating a strain of yeast with a specific defect and then introducing fragments of human genetic material. When the yeast takes up a human gene whose function replaces the defect, it can be made to grow normally.

POLYDEE-10 TAR POLYMER WATERPROOFING SYSTEM (COLD APPLICATION)

Greensboro Polychem has introduced Polydee-10 Tar Polymer Waterproofing System. Two liquid components are to be mixed at room temperature and they set into tough and hard mass after 12 to 18 hours. It is claimed by the manufacturers that the system does not contain any solvent hence films do not have any evaporation pin holes and gives a superior impermeable coating. Various grades are available from very hard to medium soft, soft and finally elastomeric state, which has extensive use as an expansion joint filler for RCC structures. The coating has remarkab resistance to environmental corr sion, ultra violet rays, oxidatio abrasion and good dielectric strengt It is chemically inert and is non bio-degradable. Polydee-10 Ta Polymer is chemically stable upt 140°C and does not melt at elevate temperatures. Polydee has goo bond with almost all constructio materials and is an excellent wate proof coating for terraces, terrac gardens, toilets, sunk floors, chajja water/chemical tanks, industria floors, underground and overhea structures and snow slip coating. I can also be used in electrical an electronic industries as encapsulat ing and potting compound, electrica insulation and corrosion proof coat ing, cable jointing compound, an for making moulds and pattern Further details can be had fro Greensboro Polychem Pvt. Ltd., 21 Defence Colony, Fly-over Commer cial Complex, New Delhi-24.

PETRORESIN — PETROLEUM RESIN

Yuen Liang Industrial & Co. Lt Taiwan has developed PETRORESIN a product constituted by hydrocar bon Resins manufactured by speci copolymerisation method. This is Thermoplastic Resin matching Poly ethylene, PP, Polystyrene etc, an possesses a lower molecular weigh The colour resembles that of Resi A special catalytic copolymerisatio method has been devised to yie different commercial grades of Petro resin to suit various applicatio Devoid of carboxylic acid group an Estergroup, it displays excellent st bility against alkalis, dilute acid and sea water. Due to its water re sistance and adhesive properties is used in paints and coatings. B ing compatible with all other n tural and synthetic resins, it hel to reduce the cost of costly resin Other properties like Resistance alcohol, non-saponifiability, ch mical neutraility and non-toxici insulating property and heat resi tance increases its range of indu trial uses. Yuen Liang Petroresi find applications in Paints a Varnishes, Printing Inks, Paper ma ing, Plastics, Rubber, Floor, ti Adhesives, Textile finishing e For details write to: Ajay Intern tional, 7, Raikar Bhavan, 2nd Flo Sector-17, Vashi, New Bomba 400 705.

Sandvik Asia to set up cobalt recovery plant

Sandvik Asia's letter of intent for manufacture/recovery of cobalt metal and powder has been converted into an industrial licence and the company has installed an annual capacity of 10 tonnes.

The industrial licence for manufacture of tungsten metal and its alloys/compounds will enable the company to market intermediate products used in the manufacture of cemented carbide as also alloys and compounds of tungsten metal.

Last year, the company completed modernisation and upgradation of production technology and equipment. An investment of over Rs. 4.9 crore was made in this respect with an emphasis on quality and productivity improvement, pollution control and automation. The chemical pilot plant produced last year cobalt powder worth Rs. 40 lakh and also recovered tungsten powder from tungsten scrap. This meant a lower level of imports of tungsten ore needed as basic raw material. The scrap oxidation process used for these recoveries has been standardised and a patent obtained by the company.

The company has also developed import substitution in the manufacture of titanium carbide. This powder is used mainly for the company's own requirements. Projects are under way for recovery of tantalum/niobium carbides also from the scrap material.

The management says that the products developed by the R and D have found a high degree of acceptability in the market. Hard facing electrodes, guide rolls and electrical contracts are in the company's regular product-mix. Special coated grades for railway wheel machining, developed at the R and D centre, have also had successful field trials.

RRL(H) CONTRIBUTION IN THE FIELD OF ADHESIVES

RRL(H) has undertaken the development of adhesives required for major, small-scale and tiny-sector industries since 1984. The following technologies developed by the laboratory are ready for commercial exploitation:

Contact Adhesives

These are solvent-based structural adhesives and they develop rapid bond strength, combined with tack or autolesion as well as resistance to water, oxidation, oils, acids, etc. Important applications of neoprene-based contact adhesives are: Bonding of high pressure laminates such as for bonding wood, metal, stone, etc; in construction industry for laying synthetic vinyl tiles, adhering faces to paper and wood core materials in flush doors. etc; in shoe industries for permanent attachments of shoe soles; and in automotive industry for adhering sponge insulation strips to doors, etc.

Automotive Gasket Adhesive

This is a two-part adhesive system comprising thermoplastic resins (nitrile rubber) and thermoset resins (phenolic resin). This adhesive is recommended for bonding tin to asbestos for automotive gasket manufacture.

Pressure-sensitive Emulsion Adhesives

Pressure-sensitive acrylic copolymer emulsion adhesives, having high tack values suitable to various tape backings such as paper, cellophane, PVC, tin and aluminium, have been developed.

Pressure-sensitive Solvent-based Adhesives

These are suitable for making double sided cloth backing adhesive tapes. The heavy duty double sided industrial tapes are required in huge quantity for adhering rubber stereos to metal drums in flexography printing units.

Anaerobic Structural Adhesives

The knowhow for commercial manufacture of dimethacrylates and anaerobic compositions is available. These adhesives are recommended as thread lockers, gasket sealants and retaining coaxial joints.

Adhesives for "Difficult-to-Adhere" or Low-energy Surfaces

These are essentially copolymer emulsions of Class II variety based on vinyl acetate. These are used in bonding plastic surfaces to porous cellulosic surfaces. They confer better adhesion to many surfaces such as tin foils and plastics.

Polyvinyl Acetate Homopolymer Adhesives

These emulsion-bound polymer adhesives of Class IA, IB and IC were developed. These are useful for furniture laminations.

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Upasi for regular hikes in rubber prices

Upasi has repeated its plea for periodic increase in rubber prices to cover all costs.

Upasi's secretary B. Sivaraman, said: "We have not asked for a runaway price, but a periodic increase to accommodate the hike in costs by way of labour wages, spraying oil, spraying, taxes etc. This we consider necessary because the current price band for natural rubber, Rs. 16.50 to Rs. 17.50 per kg., is based on a costing undertaken by the Union finance ministry for the year 1986 and it is, therefore, only appropriate that the subsequent escalation has to be compensated for especially in a situation where the bulk of the holdings are small and marginal." It wants Rs. 18.50 from April 1 1988 as the fair price.

"In spite of what is conveyed by the user industry, the fact of the matter is that the rubber prices have remained relatively constant in recent years, averaging at Rs. 16.94 per kg. in 1985, Rs. 16.70 in 1986 and Rs. 17.66 in 1987."

Citing official records he said, the price of tyres, tubes, beltings, hoses etc. have moved far out of proportion to that of natural rubber.

TABLE 1

INDEX NUMBER OF RUBBER AND RUBBER PRODUCTS

Base: 1970 = 100

	1983_84	84-85	85-86	86-87	Decr.
Rubber	359.4	333.6	349.2	336.5	340.5
Rubber products	316.6	335.3	360.6	381.6	403.2
Tyres	331.1	353.4	381.5	398.9	422
Tubes	333.9	358.4	420.1	437.6	481.9
Rubber belting	323.8	363.0	396.1	435.3	435.3
Hoses	461.6	473.7	502.8	562.9	565.5
All commodities	316.0	338.4	357.8	376.8	410.3

Source: Office of the Economic Adviser, Ministry of Industry, Govt. of India.

It recalls, "when norms were revised to this level in 1974, it was specifically understood that 50 per cent of the stocks would be held by the manufacturers and the balance by the growers and traders. While this ratio was, by and large, maintained until 1981-82, it will be seen from the table below that their share has dwindled to 31 per cent in 1987-88, representing barely a month's average consumption of all sectors.

"In other words, while operational stocks are continued to be maintained at the level of 3 months, much of the burden has been gradually shifted from the manufacturers to the growers and traders."

Regarding price and buffer stocking, Upasi says, "By commissioning Dr. B.C. Sekhar and obtaining through his report on "Natural rubber supply in India-Scenario upto 2000 A.D.," their oft repeated claim that the cost of production is far lower than the price band under the buffer-stock scheme, the All India Rubber Industries Association has called for a review of the official policy on prices, imports and buffer stock to the detriment of the growing community. The ramifications of the World Bank's study channelised through the Institute of Public Enterprise on natural rubber as being a case of "effective incentive scheme for Indian agriculture" are too early to be recognised.

"Against this background, rubber prices have remained relatively stable in recent years and index numbers of wholesale price of rubber have been much lower than in respect of other rubber products and even that of all commodities. With the overall inflationary environment, our pleas for an upward revision in the price band becomes necessary in keeping with the cost of production."

Expressing satisfaction with the supply management arrangements by the government of India, culminating in the setting up of the monitoring group last year for the procurement and distribution of rubber, Sivaraman said, "There is now an apprehension in the minds of growers arising from recent studies which tend to put the price of natural rubber in an improper perspective."

According to Upasi, the last official costing of natural rubber by the union finance ministry was for 1986. Revised once it continues to remain the basis for fixation of the price band at between Rs. 16.50 and Rs. 17.50 per kg. effective from May 1987.

Upasi wants further updating in the light of increases after that. Wages alone account for 75 per cent of the estate level costs. Increases during the past year have been 14.2 per cent in Kerala, 28.2 per cent in Tamil Nadu, and the daily wage rate effective from 1 April 1988 in both traditional states being Rs. 23.18 and Rs. 27.85 respectively. Prices of chemicals and oils during the period have been up by 44 and 33 per cent respectively. Another factor is the steep increase in plantation tax in Kerala from April 1 1988 which will add 25 paise to the cost per kg. Cost of production per quintal is Rs. 1,851.85 and yield per ha, 1150 kgs. Hence, a fair price of Rs. 18.60 per kg. sought by Upasi.

Upasi has pointed out all these difficulties to the Union ministry of commerce in its memorandum of March 28. It has asked that imports of the deficit of 29,000 tonnes may be effected during the period April-July 1988 and released during the lean cropping months between May and August. It has suggested a schedule of 8,000 tonnes imported each month from April to July and release of 8,000 tonnes from May to July. The import for July suggested is 5,000 tonnes. which may be released in August.

TABLE 2

CONSUMPTION AND STOCK OF NATURAL RUBBER (IN TONNES)

Stock at the beginning of the year

Year	Consumption	Total	With manufacturers
1981-82	188,420	33,700	17,960
1982-83	195,545	39,705	23,500
1983-84	209,480	43,411	19,380
1984-85	217,510	45,150	18,310
1985-86	235,440	64,250	16,280
1986_87	257,305	55,360	24,161
1987-88	285,000	62,700 (estimated)	19,323

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Scope to boost paint exports from N. India

The export of paints and allied products from north India would go up substantially if various constraints like shortage of power and high cost of coal are removed.

At an open-house discussion on problems and prospects of exports from northern region recently, it was pointed out that north India accounts for nearly 35 per cent of India's export of paints and allied products. Paint industries located in this region will be in a position to substantially raise their products if steps are taken to enlarge the provisions under the Indo-USSR trade plan in respect of paints from 15,000 to 30,000 tonnes, chrome pigment from 600 to 1,000 tonnes, wire enamel from 5,000 to 10,000 tonnes and ultra marine blue to 5,000 tonnes.

Problems are also being faced by the industry due to lack of clear-cut directives to licensing authorities regarding facility to use either industry-wise input-output norms or firms' own input-output norms for the purpose of advance licences.

It was pointed out that compared to other regions, north India is in a somewhat disadvantageous position. Most of the places in north India are located far away from major ports, which involve additional cost towards transportation of imported inputs from Port to factory and export consignments from factory to port.

Paint manufacturers-exporters are also facing difficulties due to high prices of mineral turpentine oil (MTO) and the inability of STC to supply soyabean oil at duty-free price against advance release order. Steps should be taken to modify the rules to permit STC to get pro-rata credit towards duty-free refund against supplies of soyabean oil effected against advance release order.

US, SOVIET FLIGHTS TO STUDY OZONE LAYER

American and Soviet aircraft will make a series of flights high above the North Pole early next year to study whether there are harmful changes to the earth's protective ozone layer above the Arctic region similar to those discovered over Antarctica.

The US aircraft carrying scientific equipment would be based in Norway for flights over the Arctic in January and February.

Soviet aircraft will also make flights to study the ozone layer over the North Pole at the same time, co-ordinating information and flight schedules with American scientists.

The US officials told a Worldnet Television news conference recently that earlier satellite and aircraft studies discovered a disturbing thinning of the ozone layer over the Antarctica during the polar spring, in September and October.

The National Aeronautics and Space Administration (NASA) scientific co-ordinator, Mr. Robert Watson, and Goddard Space Flight Centre scientist, Mr. Richard Stolarski, said the ozone 'hole' appears to be spreading steadily.

"It is spreading over an area, about the size of the continental US," they said.

Although some changes in the ozone layer could be due to natural conditions, increasing evidence has pointed to chemical reactions initiated by chloroflurocarbons, a type of chemical used as coolants in refrigerators and airconditioners and to manufacture foam insulation products.

In 1986, Canadian scientists using instruments carried aloft by balloons reported discovering a large thin area in the ozone layer over the Arctic which lasted for at least six weeks.

Unlike the Antarctica hole which remains relatively stationary, the Arctic hole was observed to shift, being observed first over northern Europe and then moving over northern Canada, apparently following the movements of cold polar air.

Mr. Watson and Mr. Stolarski said the Arctic hole was not as extensive as the Antarctica phenomenon.

A recent NASA study reported that atmospheric ozone over the northern hemisphere had also declined significantly over the past two decades.

Ozone in the upper atmosphere absorbs ultraviolet rays from the sun which would otherwise cause skin cancer, reduce crop yields and damage acquatic life.

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FERTILISER PLANT:

Kribhco has eye on cauveri basin

The Krishak Bharati Cooperative Ltd. (Kribhco) would be interested in setting up a gas-based fertiliser plant in either the Cauveri or the Godavari basin, the managing director, Dr. K. K. S. Chauhan, said in Bangalore on May 23.

Dr. Chauhan said that this would be in addition to Kribhco's application for reallocation of any one of the HBJ gas-based fertiliser plants where the original allottee's letter of intent (LI) had lapsed and had not been revalidated. "We hear from newspaper reports that Apeejay's proposed gas-based fertiliser plant project at Shahjahanpur is available for reallocation," he said.

Dr. Chauhan estimated that at current costs an investment of Rs. 650 crores would be required for setting up a gas-based fertiliser plant along the HBJ pipeline. "We are confident of going into production within 39 months of the day we get the government's approval for the project," he said.

Vis-a-vis Kribhco's desire to set up a gas-based fertiliser plant in either the Cauvery or Godavari basin, Dr. Chauhan estimated that the project could be taken up only under the Eighth Plan. The gas would first have to be tested before the government could decide on how many fertiliser plants should be cited and where in these two basins. The entire process of evaluation could take another two to three more years since three more gas-based fertiliser plants along the HBJ pipeline, including the one at Shahjahanpur, all of which had been included in the Seventh Plan, would first have to be executed.

Dr. Chauhan estimated that an investment of about Rs. 700 crores could be required for setting up a gas-based fertiliser plant in either the Cauvery or Godavari basin, with an installed capacity of 7.26 lakh tonnes. Asked why the government should prefer Kribhco to other parties, he cited three reasons. Kribhco was currently generating over Rs. 100 crores by way of surplus reserves and would not be as dependent as others on loans. Kribhco's members were located in 14 states all over the country and the organisation would be in a better position to meet the demands of members if it had more than one plant. This would also fit in with the government's plans of giving co-operatives a greater role, so that 50 per cent of the farmers' fertiliser requirements could be distributed through co-operatives, instead of 35 per cent, as at present.

Finally, Dr. Chauhan cited Kribhco's performance. The organisation had set up the world's largest co-operative sector ammonia-urea plant, with an installed capacity of 14.52 lakh tonnes per year and a capital cost of Rs. 890 crores. "Not only were cost and time overruns avoided, but we saved about Rs. 85 crores," he said. The organisation had achieved a world record by producing 14.15 lakh tonnes of urea (equivalent to 97.5 per cent capacity utilisation) and 8.32 lakh tonnes of ammonia (equivalent to 93.4 per cent capacity utilisation) in the co-operative year of 1986-87, its very first year of production. In the current co-operative year, the plant had to date achieved 104 per cent capacity utilisation in terms of ammonia production and 108 per cent capacity utilisation in terms of urea production. During 1986-87, Kribhco had also set declared a dividend of Rs. 13.84 crores and made a profit of Rs. 45.6 crores.

WORLD LEAD, ZINC RECOVERY RISES

Recovery of lead and zinc from secondary sources was reported higher during 1987 as compared to the previous year. While the recovery of secondary lead amounted to 2.25 million tonnes, rising by 0.84 lakh tonnes over 1986, that of the latter at 1.27 million tonnes was up by 0.20 lakh tonnes over 1.25 million tonnes in 1986.

While total recovery of secondary zinc increased to 1.27 million tonnes in 1987, refined zinc metal output produced from secondary material was down by 0.23 lakh tonnes to 2.57 lakh tonnes in 1987. The decline was due largely to lower production in Japan and the USA.

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FGP effluent plant opened

The effluent treatment plant at FGP Ltd. was inaugurated by Mr. C. D. Oommachen, Chairman, Maharashtra Pollution Control Board (MPCB) recently. The plant is based on the principle of activated sludge system with associated various equipment.

The plant is capable of treating effluent at the rate of 180 cubic metres per day. The treated effluent will meet the standard set forth by MPCB.

The treated effluent will be used initially for gardening and later on for other industrial purposes.

Mr. C. D. Oommachen, was the chief guest at the inaugural function. Also present were Mr. Patil, member secretary of Maharashtra Pollution Control Board, and Mr. Mehta, its regional officer, and the FGP's Managing Director, Mr. S. Ramachandran.

Mr. N. N. Goyal, Works Manager, FGP, said the company believed that keeping the environment clean was a social responsibility. He stressed on the new technology of recycling the waste product in the glass wool plant resulting in effluent-free process. The new effluent treatment plant would take care and recycle the water effluent emitting from other plants, to be used in gardening.

Mr. Oommachen said it was essential to put a check on and to control pollution which, for various reasons, was getting out of hand and creating an unhealthy environment.

Mr. Oommachen said that in the early years after independence, the population was about 30 crores, whereas now it had reached to about 80 crores. In order to meet the needs of this large population agriculture was increased through the green revolution, which in turn, increased though the demand for fertilisers, new machines and farm implements. Hence, there was industrial revolution, resulting in numerous industries which tried to meet the requirements of the agricultural sector.

These industries increased and multiplied as years went by, resulting in the release into the atmosphere and water various chemicals and other toxic matters.

He said that now it had reached such enormous proportions that the Government felt compelled to introduce stringent measures to enforce pollution control.

This step was not welcomed by all, he added, because industrialists considered some of the steps taken as 'too harsh', while the press felt such steps were not stringent enough.

TANNERY EFFLUENTS : LAND BECOMES INFERTILE IN N. ARCOT

No less than 14,000 hectares of crop land became infertile in North Arcot district alone because of tannery effluents.

What is more, wells supplying drinking water in a radius of 5 to 6 k.m. have been affected. Besides wells used by the tanneries so polluted are making the processing operations difficult. The district has a heavy concentration — about 45 per cent — of tanneries in the State.

Out of 525 tanneries in the State, 25 are large, 250 in clusters and another 250 lay scattered in a few districts. A task force set up by the Chemical Club, a private body, has emphasized in its report that it is the scattered tanneries which do not have adequate land, capacity and expertise to put up individual treatment plants. The best option for them would be to shift to a new location to avoid the prospect of having to down the shutters.

According to the spokesmen of the Chemical Club, several advantages could be derived by the tanneries from such relocation. They can then set up a combined effluent treatment plant as there will be adequate space to carry out primary treatment. It will also be easy to segregate the different types of effluents, option of using the most modern technology, common service centres for ancillary units in the same campus and isolation from human inhabited areas.

The task force has recommended extension of financial concessions, including reduced rate of interest (10 per cent) on loans, a debt-equity ratio of 3:1, debt services coverage ratio of 1:2 and a moratorium of 3 years for repayment of loans.

(Contd. on next page)

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Taming the tanneries

The leather industry has grown by aps and bounds and emerged as a ajor foreign exchange earner. The henomenal growth has brought in its ain numerous problems, the most erious being environmental pollution y tannery effluents. The problem has ecome more acute in the last one and half decades following the gradual witch over from vegetable tanning to hrome tanning. According to a multi-isciplinary task force which studied he problem, there are 2,000 tanneries n India, 75 per cent of them in the mall-scale sector and barely five per ent in the large-scale sector. Most f them do not have effluent treatment acilities and the daily discharge is as igh as 15 million litres. The havoc caused on environmental resources like surface water, ground water, agricultu-al land and aquatic life is enormous. Tamil Nadu, West Bengal and Uttar Pradesh where the tanneries are con-centrated have been the principal vic-tims. In North Arcot district of Tamil Nadu, 14,000 hectares of fertile agri-cultural land have been rendered infer-tile. The entire water available in Am-bur municipality has become unfit for consumption.

In the last couple of years, there has been much talk, but little action, about controlling pollution. The inhibiting factors are the high cost of effluent treatment plants and the inadequacy of indigenous technology. The Central Leather Research Institute (CLRI) clai-ms to have developed model systems for effluent treatment and is trying to develop its expertise further with the help of Dutch agencies, the EEC and Brazil.

In the case of tanneries existing in clusters, the solution proposed is com-mon effluent treatment plants to be supported by institutional finance. About 900 such tanneries may be co-vered by this proposal. There are 1,000 small-scale tanneries scattered in different parts of the country. In-stallation of efflusnt treatment plants, beyond their means. If they are not to be closed down, they will have to be shifted to new locations. The most important recommendation of the task force pertains to these tanneries. The only long range solution, according to the panel, is to relocate them in new leather industry zones on the outskrits of urban areas, with a three to five km radius of green belt area.

URANIUM FROM SEAWATER PROJECT ABANDONED

A prolonged global uranium glut and high operational costs have forced Ja-pan to abandon a 12-year project to recover uranium from seawater, accor-ding to the Ministry of International Trade and Industry (MITI). MITI an-nounced recently that a pilot plant the ministry launched in 1975 to recover uranium will be shut down in March after two years of operation.

The government has spent 6.3 bil-lion yen on the project, which was es-tablished in the southwestern prefec-ture of Kagawa. The plant was envi-sioned during the aftermath of the oil crisis, when prices for uranium ran-ged from 24,000 yen to 30,000 yen per kg. four to five times higher than today's prices.

MITI planned to use the plant to re-cover about 1,000 tonnes of uranium by 1990. In fiscal 1986, its first year in operation, the plant yielded 5.3 kg and the next year it yielded 7.5 kg. MITI was reportedly satisfied with the initial yield. But operational expenses were too high to support.

(Contd. from previous page)

It has been pointed out that tanneries having enough land and ma-nagerial capability could put up their own treatment plants, and those in the small sector which are close to each other in clusters can have a common treatment system. On the other hand, scattered tanneries can neither put up individual treatment plants, nor can they be included in a common treat-ment plant.

The task force wants the large-scale tanneries to put up their own indivi-dual treatment units early. Already about 25 of them had taken concrete steps in this direction.

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Major pot disaster at NALCO

The smelter plant of the National Aluminium company (NALCO), in Angul, suffered a major setback last month when nearly 64 pots installed in the plant were damaged owing to an "operational negligence" resulting in huge production losses.

The plant, considered to be the largest in Asia, with most modern process technology available in the world has been designed to house 480 pots with a capacity by producing 2,18,000 tonnes of molten metal per annum. So far it has installed 190 pots.

The NALCO Sramik Congress Union President, Mr. R. C. Jena, said that with the damage of these pots NALCO had incurred a loss of Rs. 60 crores which included production losses to the tune of Rs. 50 crores and Rs. 10 crores towards resetting the pots.

Mr. Jena alleged that these pots were damaged in between April 13 and May 10 owing to negligence on the part of the engineers and the absence of proper co-ordination among the cast house, pot plant and the anode plant. He said the plant could not install new pots unless the destroyed pots were resettled by August this year.

Realising the gravity of the situation, the NALCO authorities have only transferred the plant's Executive Director, Mr. L. K. Panda, its general manager and chief engineer, he said. But mere transfer would not solve the crisis Mr. Jena said adding that a high-level inquiry is necessary to book those engineers also responsible for such incident.

He said five CISF personnal were charge-sheeted when aluminium worth Rs. 40 lakhs was stolen from the plant with the connivance of the Central Industrial Security Forces (CISF) personnal in 1984.

Mr. Jena alleged that senior officials of the plant were trying to hush up the matter, which he said could have been easily avoided had the engineers in change of pot rooms ensured proper co-ordination with other houses.

ALUMINIUM PHOSPHIDE CARTEL BUSTED

The Monopolies and Restrictive Trade Practices Commission has busted the cartel formed by the manufacturers of aluminium phosphide, a fumigant used in storage of foodgrains.

The commission has restrained the three monopoly producers of aluminium phosphide Excel Industries Limited, Inventa Corporation and Swadeshi Chemicals Private Limited — from indulging in the restrictive trade practices of collusive trading and quoting prices in consultation with each other to artificially jack up the rates.

The three manufacturers, who control the major chunk of the aluminium phosphide production, have been quoting identical prices to the Food Corporation of India, the major buyer of the pesticide.

The companies had offered to supply 30 tonnes each at the identical price of Rs. 90 per kg in response to a tender floated by FCI. In case of another tender, the price quoted was Rs. 102 per kg by all the manufacturers. Later, this price was lowered by an equal margin of Re 1 after negotiations.

The director-general of investigation and registration in the company affairs department, who took up the case against these companies, submitted before the Commission that when three different parties quoted identical rates in two tenders and the parties reduced the quotation by the same margin in one of the two tenders and did not agree to any cut in another, it can be concluded that the parties have acted out a common understanding before ending in their offers and during the course of negotiations.

A relevant factor on which the director-general based his argument, was that despite significant differences in the costs of production of the three companies, they chose to offer the same price for the supply of aluminium phosphide.

The Commission held that in the absence of the agreement among the manufacturers, they would have competed with each other in respect of price depending upon their individual cost of production, profit margin and other market considerations.

The three companies, which initially denied any collusive trading on the part, later took refuge under the gateway clause of the MRTP Act to justify their cartel-like trade practice. The argument advanced was that since FCI was the dominant and the largest buyer of aluminium phosphide, the manufacturers could be justified in acting in consultation with each other so as to have a bargaining leverage vis-a-vis the largest buyer.

This argument, however, was rejected by the Commission, which noted that FCI even though a "preponderant purchaser is entrusted with one of the most nationally important job, namely procurement, storage and distribution of foodgrains. FCI needs the public distribution system under which grains are sold to the vulnerable sections of the society through a chain of fair price shops at concessional rates.

The Commission held that in view of the detriment to public likely to result from the concerted action by the respondents in negotiating terms with FCI, they are not entitled to the gateway.

GRAUER & WEIL

Grauer & Weil (India) has maintained the equity dividend for 1987 at 18 per cent absorbing Rs. 7.71 lakhs (same). The company has earned a marginally lower gross profit of Rs. 75.02 lakhs during the year against Rs. 80.33 lakhs in the previous year. Sales have, however, been higher at Rs. 17.50 crores against Rs. 13.81 crores.

After providing Rs. 48.92 lakhs (Rs. 28.51 lakhs) for depreciation and Rs. 10.25 lakhs (Rs. 12.50 lakhs) for taxation and after some adjustments, the profit available for disposal is Rs. 16.29 lakhs against Rs. 40.08 lakhs in 1986. A sum of Rs. 8.50 lakhs (Rs. 32 lakhs) is transferred to general reserve.

Guwahati refinery tops target again

Indianoil's Guwahati Refinery has ceeded the target for processing ude oil set by Oil Economy Budget EB), for the second consecutive ar in 1987-88.

The Refinery processed 0.815 million tonnes of Assam crude in 1987-, as against the target of 0.80 million tonnes set for the year.

The Refinery has, thus, achieved 01.9 per cent of its target in 1987-. This was possible due to better eventive maintenance, improved operational practices and constant upgration of technology, according to IOC press release issued on May 4th.

The record production of major oducts by the Guwahati Refinery durg the year 1987-88 includes LPG ooking gas) at 7.9 million tonnes, arly five per cent higher than the evious year, superior kerosene at 29.5 million tonnes, an increase of 3.7 per cent over last year and mide distillates which were higher by .6 per cent.

There has been a record LPG prouction of 7942 million tonnes for he year, registering an improvement recovery.

The 'naphtha splitter', a special unit f the Guwahati refinery, also registerd a record production of 22.87 million tonnes of special naphtha, registering an increase of 48.9 per cent ver the previous year. The naphtha is upplied to Bongaigaon refinery petrochemicals complex for manufacture of xylene.

The modernisation of crude distillation unit, already completed last year, enabled further fuel savings of about 5600 tonnes, apart from improving the productmix.

This modernisation included heater replacement in the crude distillation of the refinery. Among the major projects completed during the year are modernisation of oil separators at a cost of about Rs. 49 lakhs.

This will facilitate arresting of movement of unwanted sludge to the downstream units, thus improving the overall efficiency of the effluent treatment plant. The water discharged from the effluent treatment plant after testing is pumped through a 30-km pipeline, already constructed into the river Brahmaputra.

Microprocessor-based controlled instruments in new furnaces of the crude distillation units have also been installed for better operational controls. The microprocessor-based loading system already installed is also in successful operation.

W. BENGAL TO REMAIN SITE FOR PETROCHEM PROJECT

Union minister for finance and commerce N. D. Tiwari said recently the petrochemicals project proposed for West Bengal would not be shifted to any other state. However, Mr. Tiwari said further discussions on the techno-economic feasibility of the Haldia petrochemicals project were required to ensure the viability of the project.

West Bengal chief minister Jyoti Basu and Mr. Tiwari told reporters after their meeting in Calcutta recently, that any changes in the parameters of the project would depend on the financial institutions.

As both Mr. Basu and Mr. Tiwari will be out of the country in the next fortnight (Mr. Tiwari will be in Rumania and Mr. Basu will be visiting China and Japan), a meeting between W Bengal finance minister Ashim Dasgupta and other government officers with the Union finance secretary has been scheduled for the end of this month in New Delhi.

Earlier in the day, Mr. Tiwari told newsmen that the project had been accepted in principle, but the question of funds was posing a problem. The modalities of the project, he said, would have to be worked out carefully to make sure that the unit did not turn sick. Regarding the Bakreswar power project, the minister stated that the Soviet line of credit would be available only if the power plant was set up in the Central sector. "Let the West Bengal government agree to this", he said.

Though the chief minister has agreed to further discussions on the Bakreswar project, he is understood to have made it clear to the Union finance minister during the meeting, that if the Centre did not sanction the project within three months, the state would go ahead and put up the power plant by mobilising resources on its own.

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TECHNOLOGY EXPORT

ONGC fast expanding global operations

A memorandum of understanding (MoU) has been signed between the Oil and Natural Gas Commission (ONGC) and Sonangol — national oil company of Angola — under which both the parties would identify areas of cooperation and chalk out detailed package services in training and consultancy.

A senior-level team from Sonangol visited ONGC's facilities, including the Institute of Petroleum Exploration, Institute of Drilling Technology, Institute of Management Development and the computer centre at Dehra Dun recently. It also visited the Institute of Reservoir Studies at Ahmedabad and Bombay offshore and held detailed discussions with senior officials of ONGC.

ONGC and Sonangol, as per the MoU, have agreed to consider the possibility of joint oil exploration and exploitation ventures in Angola. Hydrocarbons India Ltd. (HIL), which is a wholly-owned subsidiary of ONGC, has been identified as the nodal agency for implementing, and co-ordinating the various modalities of the MoU.

Meanwhile, a production sharing contract has been finalised between ONGC and Petro-Vietnam — the national oil company of Vietnam. The agreement would be formally signed soon.

ONGC is also negotiating three consultancy projects with Petronas, the national oil company of Malaysia. The draft contract between the two parties is now under finalisation.

As a part of its bid to expand its operations at a global level, ONGC has recently trained engineers from Bahrain National Oil Company (Banoco) in the area of advance drilling technology at its institute of Drilling Technology, Dehra Dun. Another batch of trainees from Banoco would shortly commence training at the same institute.

ONGC, along with EIL, has sent proposals to National Oil Company of Libya regarding the underground gas storage project in a field of Libya, operation and maintenance of the Begamisurata gas pipeline as well as consultancy project for an offshore gas pipeline. It has offered its consultancy services to Waha Oil Company of Libya in the field of core analysis, and simulation studies.

ONGC has also offered its consultancy services to the petroleum research centre at Tripoli in the field of reservoir engineering.

Nearer home, ONGC recently mad an offer to train engineers and scien tists of the Bangladesh Oil and Ga Mineral Corporation (BOGMC). At th request of BOGMC, a comprehensiv proposal to train its engineers an scientists in the field of petroleum pro duction technology and reservoir eng neering has been formulated. Th training programme, to be organised b ONGC's Institute of Management Deve lopment, Dehra Dun, envisages no only classroom lectures and tutoria sessions, but would also lay emphasi on field training at its field sites. ON GC has also made an offer to under take joint projects with BOGMC.

According to informed sources, mu tually beneficial co-operation proposal for providing consultancy and trainin are also being negotiated with coun tries such as Uganda, Iraq, Sudan, Sey chelles, Sri Lanka and Tanzania.

ONGC's overseas operations polic aims to export its expertise and tech nologies to other developing countries The collected data about the other ba sins in the world helps to enlarge da ta bank which is vital for geoscientifi studies leading, in turn, to better inter pretation of data in its exploration ven tures.

Another promising advantage o exploring abroad for an oil importing country like India is that, if success ful, an assured supply of crude oil from abroad at production cost would b available. This strategy has been suc cessfully adopted by many oil import ing countries, including France and Japan.

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Oil consumption likely to rise at a slower pace

The growth in oil consumption of the developing world is expected to be only "moderately lower" in 1988-89 than in 1986-87 and will remain well above that of the industrial countries.

This assessment has been made in a staff survey of the International Monetary Fund (IMF) while taking into account measures taken by some of the developing countries to stem the rise in oil use.

Assuming that oil prices will remain in $ 15 to $ 18 a barrel range, world oil consumption is expected to grow in 1988 and 1989, although at a slower pace than in the past two years.

Total oil production outside the members of OPEC is expected to increase "moderately" in 1988 and 1989. The decline in spending by the oil industry on exploration and development of productive capacity in the wake of the 1986 oil price drop will continue to affect output in some areas. At the same time, this tendency is being offset partly by a considerable reduction in the cost of supplies and by efficiency improvements, including the effects of increased use of new engineering and information technology.

Moreover, the bringing into production of oilfields discovered in recent years in some hitherto net oil importing developing countries, notably the Yemen Arab Republic, is expected to contribute to a larger increase in output of the non-OPEC developing countries in 1988 than in the previous years.

Total production in the industrial world is, however, expected to decline somewhat further, with a continuing drop in the output of the US and probably also of the UK being offset partly by a further rise in production of Norway.

The expectation of only a relatively minor increase in total non-OPEC output during 1988-89 is based also on the somewhat uncertain assumption that some non-OPEC countries will continue to restrain production.

Oil market conditions will also be affected by changes in worldwide inventories during 1988 and 1989. Following a build-up of stocks by the oil industry over the past two years, total commercial inventories were relatively high at the beginning of this year.

With a possible reduction of excess stocks and relatively small changes in world oil consumption and non-OPEC supplies, world demand for OPEC oil is expected to increase only slightly by about one to two per cent in 1988, according to the survey.

A somewhat larger increase in OPEC production and exports is expected for 1989 on the assumption that the inventory will not change significantly during this year. The unused production capacity of these countries will, however, remain substantial, says the study report.

Given these prospective developments in demand and supply, the evolution of oil prices in 1988 and 1989 will depend crucially on the ability of the major oil-exporting countries to implement an effective policy of concerted output restraint.

While adherence to the official export prices by the members of OPEC is related to this issue, the pricing method is of somewhat lesser importance, as a large part of total OPEC oil sales in any event is outside the official price system and as the level of aggregate supply is the key element determining spot market prices over time.

Exports not covered by the official prices include extra heavy crude oils, refined oil products, condensates and natural gas liquids. In addition, sales under various types of barter arrangements and to market outlets owned by OPEC countries are effectively outside the official pricing system.

While prospective developments in the Iraq-Iran conflict represent a particular uncertainty in any assessment of oil prices in the next few years, the price would also be affected by major changes in world economic activity. For instance, if economic growth in the industrial countries were to turn out to be lower than projected for 1988 or 1989, oil prices are more likely to be under downward pressure.

MPI concern over major projects delay

The Ministry of Programme Implementation (MPI) has expressed concern over the "enormous" loss to the national economy due to delays in commissioning of major projects on schedule.

According to a report of the Ministry, its flash report system of monitoring "has not been able to make a dent in containing the time over-runs in the projects".

In fact, the number of projects reporting incremental delay in the first nine months of 1987-88 has shown an upward trend over the previous year, the report says.

Stating that the cost of delay to the national economy is "enormous", the report says it seriously vitiates the initial appraisal of a project with regard to its viability.

The scenario of implementation of projects costing Rs. 100 crores and above reveals an endemic problem of time and cost over-run in a majority of cases.

As on January 1, 1988, 78 projects out of a total of 124 had reported delay in the implementation. The anticipated capital cost of these delayed projects had escalated to Rs. 46,039 crores from the original estimate of Rs. 26,914, crores.

Till December 1988, 45 major projects had put back their dates of commissioning by periods varying from one to 12 months.

The report, however, has made efforts to identify the causes for time and cost over-run. They include delay in acquisition of land, lack of infrastructural, facilities, inadequate project preparation, poor selection of consultants and delay in the preparation of tenders and placement of orders.

The report also cites other factors which resulted in the delays. They include inefficient working of contractors, delay in completion of inter-linked facilities by other agencies, mid-course changes in the design and non-availability of commissioning experts from indigenous and outside sources.

The report says that out of six projects in the atomic energy sector, the Narora project has been delayed and continues to lag behind in the implementation. "It has taken an inordinately long time for the Indian vendors to imbibe the technology for the manufacture of sophisticated and high-reliability equipment for the atomic power plants."

There are 70 projects in the monitoring system in the coal sector. Of these, 32 projects have been delayed with respect to the original schedule of commissioning, while 11 have put back their schedule of commissioning by periods varying from five to 36 months.

Problems of delays in supply of equipment by the Heavy Engineering Corporation continue to bog down several projects in the coal sector.

In the fertiliser sector, 12 projects are being monitored with an estimated cost of Rs. 3,447 crores. The Haldia fertiliser project was mechanically completed in 1979 but could not be commissioned till now due to a series of equipment breakdowns. The Paradeep fertiliser project has been delayed due to fund constraints.

There are five projects in the mining sector with a total cost of Rs. 3,108 crores. All the three aluminium projects in the sector have been delayed with respect to original schedule of commissioning.

In the chemicals and petrochemicals sector, there are nine projects with an estimated cost of Rs. 1,955 crores under monitoring. The Maharashtra gas cracker complex in the sector is the only on facing difficulties in obtaining environmental clearance.

Of 26 projects with an estimated cost of Rs. 10,242 crores in the petroleum and natural gas sector being monitored, 14 have already reported completion during 1987-88.

The report points out that massive investment made in the south basin gas fields and the Hazira-Bijaynagar-Jagdishpur (BHJ) pipeline would re-

(Contd. on Col. 3, p. 67)

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FLOATING PLATFORM

PIB approves ONGC charter proposal

The PIB has approved an ONGC proposal for deploying a "floating early production system" for exploitation of newly discovered structures in the western offshore.

The ONGC proposes to charter a floating production platform for two years involving an investment of about Rs 34 crores for this purpose, it is learnt.

While several structures are claimed to have been found as oil bearing and suitable for exploitation the immediate ones which are expected to be tapped under the new scheme include the B-57, B-131 and BH-25 structures, as per PIB approval.

The first early production system, namely, Sagar Lakshmi was commissioned in December 1986 in the Panna Field the oil produced from the field is being processed at this jackup-base production facility and is transported to a tanker via a single buoy mooring system (SBM).

Incidentally, out of the 63 discoveries put on production (58 oil and five gas) since inception, 26 have been put on early production system (25 on land and one offshore), during the last three years. These structures are reported to have contributed to an increase in output of 0.5 mt per annum.

In the western off-shore, installation of these floating early production systems would, it is claimed by ONGC, result in reducing the time for starting the production besides helping in reservoir appraisal. The system permits long-term testing and involves low capital investment.

The floating early production system can be used as an extended facility or can even become a permanent installation. It can also be relocated serving both the immediate and future needs.

The floating process facility, it is explained, will have all utilities and living accommodation required to run and maintain the system. The crude oil produced sub-sea would be pumped to the tanker moored to the SBM located nearby. The transportation of crude would take place by transferring the stored crude to another vessel used as shuttle tanker.

KRIBHCO HAZIRA UNIT'S FEAT

The Hazira plant of Krishak Bharati Co-operative Ltd. (KRIBHCO) has established a new record in the production of urea and ammonia.

Unit recently, the Hazira unit's daily production touched 4,975 tonnes, equivalent to 113.07 per cent of the rated capacity of 4,400 tonnes per day. Recently the production of ammonia went up to 2,696 tonnes, equivalent to 109.96 per cent of the rated capacity of 2,700 tonnes per day.

The Kribhco Managing Director, Dr. K.K.S. Chauhan, said that during the co-operative year 1987-88 (July 1 to May 18) the plant produced 13,81,673 tonnes of urea, or 107.7 per cent of capacity utilisation. The production of ammonia for the same period was 8,15,320 tonnes or 103.8 per cent of capacity utilisation.

According to Dr. Chauhan, the Hazira plant with a rated capacity of 14.52 lakh tonnes of urea per annum has produced a total of 31,04,958 tonnes already since the launch of commercial production.

(Contd. from p. 66)

main heavily under-utilised due to serious delays in the commissioning of four gas-based fertiliser projects in the private sector and three gas-based thermal power stations being installed by the National Thermal Power Corporation.

A major problem in project implementation in the petroleum sector is the delay in supply of equipment by Indian vendors.

"The policy of indigenisation has not resulted in significant reduction in the overall import content, as most of the raw material and hi-tech components and equipment are still imported. Indigenous value-added content is in fairly low tech area," the report observes.

There is need to re-evaluate of restructure the policy on indigenisation.

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NCL plea to rationalise pricing policy

The Chairman-cum-Managing Director of Northern Coalfield Ltd. (NCL) Mr. Mahanand Jha, says a regional coal policy is warranted to enable the more profitable subsidiaries of Coal India Ltd. (CIL) to get a reasonable price for their produce and overall profitability.

Addressing a group of visiting newsmen, he said if a regional pricing policy cannot be operated, the Government will do well to rationalise the coal pricing policy at the time of the next revision for a more realistic bearing on the cost of coal production.

In his view, since the cost plus basis has been adopted for all other commodities, there is no reason why such a system should not be adopted for the coal industry too.

Outlining NCL's performance, Mr. Jha said delay in getting land from the governments of Uttar Pradesh and Madhya Pradesh is holding up the implementation of Amlorhi and Nigahi projects.

Significantly, the two projects have been linked to National Thermal Power Corporation (NTPC) Srihand and Vindhyachal super thermal power stations (STPS).

The NCL authorities are, however, confident that the power projects will not suffer because of these delays in NCL's project implementation. They have made arrangements for the supply of coal from other sources.

At the moment, what is causing concern to the CIL subsidiary is the low offtake by some of the plants in the region.

For instance, the Uttar Pradesh State Electricity Board (UPSEB) is lifting only 5,000 tonnes of coal a day against a commitment of 8000 tonnes. The Vindhyachal STPS has not lifted any coal for the last six months despite an agreement with NCL for lifting 50,000 tonnes a day.

Similarly, Rihand STPS's offtake has not been more than 400 tonnes a day because the "merry-go-round" (MGR) rail system for coal transportation is yet to be completed.

Pointing out that there are no penalty clauses in the agreements between NCL and NTPC, Mr. Jha said NTPC's low offtake has been resulting in stockpiling. At the time of shortages, NCL will rush supplies to NTPC from other sources, bearing the additional transportation costs, which are not compensated by the Corporation.

The mismatches in linkages between NCL and NTPC, he said, will have to be sorted out at the Ministry level. However, often the fact that NCL and NTPC belonged to the same Ministry stands in the way of sorting out these bottlenecks.

Headquartered in Singrauli in Madhya Pradesh, NCL has identified 11 mining blocks for the extraction of coal by open-cast method. While six of the blocks are in MP and three in UP, two stretch across the two States.

While Gorbi, Jingurdha, Kakri, Bina, Diduchua and Jayant projects are in operation, nine other mining blocks a in different stages of developmer The Diduchua mines began productio in December 1987 with World Ban aid, while work on the developmer of the Amlorhi and Nigahi mines on with the assistance from the U and the USSR respectively.

The most distinctive feature of th mines under NCL is that most of ther are linked to the pithead power pro jects. Jinghurda (three million tonnes supplied coal to the Birla's Renusaga captive power plant, Gorbi (1 millio tonnes) and Bina (4.5 million tonnes to the three Obra plants of UPSEB Jayant (10 million tonnes) to the Sin grauli STPS of NTPC and Kakri (2. million tonnes) to the Naparahanpar of UPSEB.

With its highly mechanised opera tions and a low workforce of 12,00 NCL has achieved a growth in produc tivity of 15.44 per cent during 1987 88 over that of last year. During th period, it has registered a profit of Rs 74.20 crores.

During the year, the growth in com posite production was 25.99 per cen with production of coal at 16.50 mil lion tonnes (MT) and 53.67 millio cubic metres of overburden (OB) — the amount of earth that has to be re moved to extract the coal.

The targets for coal and OB fo 1988-89 have been fixed at 19.35 M and 65.1 million cubic metres respec tively. Coal production during th Eighth Plan is likely to double by tou ching the 40.5-MT mark.

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COAL SECTOR DEVELOPMENT :

Efforts on to seek foreign assis tance

The coal sector is making a concerted effort for bilateral co-operation with advanced countries for improving the planning, designing and management of coal projects to reach international standards in key areas like productivity and safety.

According to a senior official of the Coal Mine Planning and design Institute (CMPDI) in Ranchi, bilateral working groups have been set up with advanced coal producing countries which are interested in assisting the development of coal and lignite sectors in India.

As a result of the efforts, the official said, a long-term programme of co-operation in coal sector up to 2000 AD has been drawn up with the USSR under which the Soviet Union will assist in developing 15 coal mining projects from the state of preparation of feasibility report up to the stage of their final implementation.

According to the official, the USSR has also agreed to assist in modernisation of the Patherdih washery. A coal preparation engineering institute and a mine construction division have already been set up in CMPDI in Ranchi, with Soviet assistance.

The USSR will also help India in underground gasification of coal and geological exploration of coal resources. Proposals to develop an integrated fuel energy complex at Mukunda and associated power complex at Neyveli are also under consideration.

Out of the 15 coal mining projects agreed to be developed with Soviet assistance, five are open-cast projects and ten underground projects. Of these, seven are of BCCL, three of NCL, four of ECL and one of SCCL.

The official said sanction orders for three projects Viaz Khadia, Jhanjra and Nigahi, have been obtained and orders placed for equipment required for the projects. For the Mukunda mining project, a revised report has been prepared and processed for investment sanction.

Contracts for preparation of project reports have been also signed and geological data supplied to Soviet experts in respect of Mohar, Sitanala, Kumari and Prakasham Khani projects.

Project profiles have also been given to Soviets and geological data for preparation of project report is being collected for Kapuria, Mahal, Parbatpur, integrated Kharkharee-Dharmaband, Barmondia, Dakhin Khana and Sripur Taltora projects.

The official said efforts to seek foreign assistance is aimed at developing large capacity opencast coal and lignite projects and underground mining in difficult geomining conditions, with higher production and productivity in order to meet the fast growing requirements.

Specific areas for bilateral co-operation in the two sectors are being identified by the joint working groups. The areas include assistance for specific projects from the beginning to their implementation and completion, supply of equipment and expert services as well as training of Indian mining personnel.

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Searle (India)

Mr. H.V. Goenka, chairman, Searle (India), has said that the pharmaceutical industry's hopes have been short-lived. Despite the increased mark-up permitted under the new order and the reclassification of drugs into two categories, the increased trade margins, as announced recently to the retailers, reverts the position to where it was before the order. The new order has very nominal effect on the company's products.

The current year, according to the chairman, has begun on a very optimistic note. The good rabi season in 1988 appears to have helped the company improve its sales for the first four months and barring unforeseen circumstances, the company should fare well in the current year.

forecast improved sales in the coming months. The company expects to introduce some products in the veterinary field during the current year. Extension of the product range in the diagnostics, locally manufactured as well as imported, will add to the sales.

Sales of agrochemicals are developing satisfactorily despite drought conditions. The agro division is also engaged in development of cotton hybrid seeds and will soon launch a new line of business in hybrid and high-yielding seeds. The prospects for the current year, therefore, are expected to be significantly better than last year. The company's subsidiary in Nepal, Hoechst Nepal (Private) Ltd. is going ahead with the construction of the building and plant for its pharma formulation activities.

HOECHST INDIA

Hoechst India expects significant improvement in its profitability of its domestic pharma operations during 1988 on account of the new DPCO introduced in August, 1987. Amongst the new products, Omnatex and Thental have been well received in the market and their sales have shown positive trends. Sales of human rabies vaccine are according to expectations. The performnace is encouraging enough to

NATIONAL ORGANIC

National Organic Chemical Industries Ltd. (NOCIL) is awaiting clearance for an industrial licence to undertake modernisation and substantial expansion of its petrochemicals complex in Thane. The Maharashtra Pollution Board is presently considering the company's application for a no objection from the pollution angle. Two writ petitions have been filed in the Bombay high court in November, 198 and February, 1988 against the loca tion policy of the Maharashtra goverr ment for setting up new industries an expansion of the existing industries the Thane Belapur area. The compa ny has decided to intervene in bot these petitions.

The company has submitted an ap plication for obtaining MRTP clearanc for undertaking business in seeds a an activity to its agrochemical bus ness.

The company has decided to inve a sum of Rs. 32.60 lakhs for acquirin equity shares of Mupnar Films Ltd., I dore, which is setting up a plant Pithampur in Madhya Pradesh to m nufacture biaxially oriented polypropy ene film (BOPP) increasingly used the packaging industry. The compar will be marketing BOPP films for period of 10 years from the date commencement of production.

The company's subsidiary, Ens Holdings Pvt. Ltd. has also dec ded to invest Rs. 32.60 lakhs in equ ty shares of Mupnar Films. The com pany has also decided to invest equity shares of Mafatlal industri Ltd. (MIL) and accordingly paid R 238.88 lakh towards application mo ey for 1.59 lakh equity shares of F 100 each at the rate of Rs. 150 p share inclusive of a premium of R 100 per share out of their rights issu

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Tata chemicals steps up

Tata Chemicals has achieved all-ound record working results for the ear ended March 1988. The directors ow recommended a final dividend of 0 per cent, making a total dividend f 30 per cent for the year along with n interim dividend of 10 per cent aid in December 1987. Last year, the ividend was 25 per cent on lower apital.

According to preliminary statement, ncome amounted to Rs. 230.40 cro-es against Rs. 193.56 crores last ear and gross profit before interest nd depreciation was also higher at s. 83.97 crores against Rs. 66.58 rores.

After interest (Rs. 32.32 crores gainst Rs. 21.82 crores), depreciation (Rs. 16.45 crores against Rs. 3.41 crores) and taxation (Rs. 8 cro-es against Rs. 8.75 crores), the pro-it after taxation amounted to Rs. 7.20 crore against Rs. 22.60 cro-es. After transferred to investment llowance reserve (nil against Rs. .57 crores), the amount available or appropriation amounted to Rs. 7.20 crores against Rs. 18.03 cro-es.

In releasing the results Mr. D. S. Seth, Chairman and Managing Director, stated that the company had, yet again, achieved all round record results, defying unprecedented drought conditions for the fourth year in succession and overcoming several man-made hurdles.

Operating under conditions of abundant supplies of soda ash and several other chemicals that it manufactures, the company achieved record high production and sales of nearly all its products. In particular, the soda ash production increased by 7.4 per cent and the sales increased by 8.5 per cent compared to the previous year.

Mr. Seth, pin-pointed the fact that the directors have recommended a higher dividend of 30 per cent (previous year 25 per cent) on an expanded effective share capital of Rs. 36.20 crores against Rs. 27.19 crores and the dividend pay-out this year will be higher by 60 per cent at Rs. 10.86 crores against Rs. 6.83 crores last year.

Mr. Seth also announced that the Tata fertiliser project which the company had promoted and the Tata-Indian Oil Refineries project that the company had co-promoted with Indian Oil Corporation are both making steady progress.

LEAK IN BRITISH N-PLANT

The State-owned British Nuclear Fuels (BNFL) said that there had been a radio-active leak at the Sellafield nuclear reprocessing plant — where the West's worst atomic-power accident occurred 30 years ago.

The company acknowledged the weekend leakage amid allegations that safety measures at the site were inadequate.

The BNFL's disclosure that plutonium nitrate escaped on May 22, during a maintenance exercise came as two men, claiming to be workers at the plant, appeared at a news conference and alleged that incidents involving radioactive contamination had been covered up.

They claimed that workers' radiation-dose records were deliberately falsified, serious accidents unreported, radiation monitoring systems and safety procedures sidestepped, minors illegally exposed to radioactivity and high-risk areas of the plant left dangerously understaffed.

The BNFL said it could not comment because it had launched an inquiry.

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Fusion Polymers

Fusion Polymers Limited is entering the capital market with a public issue of 9,00,000 equity shares of Rs. 10 each for cash at par. The subscription list will open for non-resident Indians on June 23 and the Indian Public on June 27.

The company has been promoted by a group of non-resident Indians and Indian businessmen with vast experience in business and industry. The board of directors includes Mr. Pravin Swadia, Chairman and Managing Director, who is an NRI engineer, Mr. Yogesh Vyas, an engineer and industrialist, Mr. Kaushal Chokshi, a engineer, Mr. S. S. Chawla, a industrialist and Mr. Roelf Van Der Wijk, an industrialist and authority in the field of Roto Moulding.

Fusion Polymers has set up a project for the manufacture of rotationally moulded plastic water and chemical tanks and other moulded products in technical collaboration with Fusion Kunststoffen b.v. of Holland — one of the largest roto moulders of Europe. The plant has a capacity of processing 1500 tonnes of LDPE, HDPE and LLDPE, say a company's press release.

Fusion Kunststoffen b.v. of Holland is a world leader roto-moulder. It has plants located in Holland, France and Belgium and has licences in Germany, Turkey, Pakistan and now India. It has a range which includes over 500 different types of products for industrial and domestic use.

Fusion Polymers' plant is at par with the finest in the world. It has imported fully-computerised carousel rotational moulding equipment from Mr. Ernst Reinhardt GmbH of West Germany — the first of its kind in this capacity range.

The company has already started production and for the six-month period July to December, 1987, it recorded a turnover of more than Rs. 80 lakhs. The company has also earned a cash profit for the half year ended December 31, 1987.

The company has a well established marketing network and its products enjoy high consumer acceptance. The company's products have unique design features which has given it a tremendous edge over its competitors, adds the release.

The company has a low break even point of 25 per cent. The directors are, therefore, extremely confident that barring unforeseen circumstances, the company shall pay handsome dividends right from the first full year of production.

The project cost of Rs. 260.44 lakhs is being met by equity share capital of Rs. 130.44 lakhs, Central subsidy of Rs. 25 lakhs and term loans of Rs. 105 lakhs.

GUJARAT ALKALIES

Gujarat Alkalies and Chemicals Ltd. (GACL) has recommended a dividend of 26 per cent for the year ended March 31, 1988, subject to the approval of financial institutions. This dividend is on the enlarged capital of Rs. 1072 lakhs after the bonus issue which works out to 31.2 per cent on the capital before the bonus issue. The amount to be disbursed as dividend will be Rs. 279 lakhs.

GACL made all-round improvement in its performance. The gross profit increased to Rs. 1778 lakhs from Rs. 1316 lakhs. The board decided to provide a higher depreciation amounting to Rs. 753 lakhs. A provision of Rs. 48 lakhs has been made to take care of the liability of income tax because of book profits as per Section 115J of the Income Tax Act.

Production also recorded an all round increase, making GACL the first company in the country to produce more than 1,00,000 metric tonnes of caustic soda in a year, the actual production standing at 1,02,700 mt.

During the year 1987-88 the company exported its chemicals valued at Rs. 133 lakhs (Rs. 38 lakhs), registering an increase of over 300 per cent over the previous year's exports.

Work on the conversion of mercury cell electrolysers into membrane cell electrolysers is progressing satisfactorily. The import licence from the Centre is expected very shortly. Among other projects on hand, in various stages of implementation, are the saltwashery, soda ash, and cold box system etc. These are likely to be commissioned during 1989.

During the year the company has made an issue of rights shares in three shares for every five shares held

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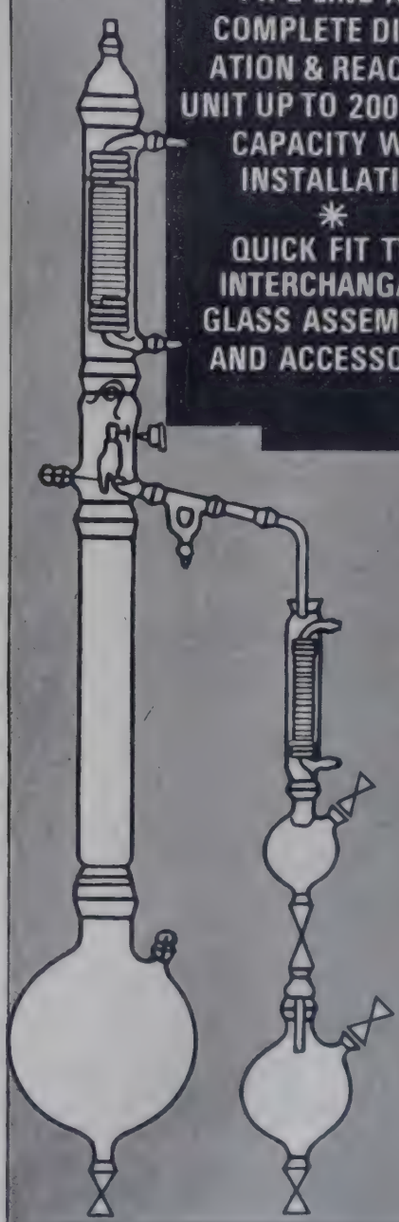

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New Plants & Products from Degussa

YANIDE-FREE REGENERATOR

After many years of intensive fort, the research and applications chnology staff of Degussa AG, ankfurt am Main, have succeeded developing a cyanide-free regen-ator for carburisation baths free om old salts. This regenerator uarantees that the necessary mount of controlled marginal car-on is present in the treated compo-ents, ensuring a high degree of onsistency in results and compo-ent strength properties. The intro-uction of this regenerator signals an nd to the use of cyanides in metal ardening, once a central aspect of egussa's salt baths technology.

The new regenerator, available nder the name Cecontrol 1, has nabled Degussa to switch its entire arburisation process to electroni-ally controlled automatic salt baths; he Durofer process, as it is known, atisfies the highest technical stan-ards. With the aid of a large number f programmes stored in the micro-rocessors, this system can conduct everal different fully-automatic car-urisation processes simultane-usly, achieving a degree of exibility and economy hitherto nknown on such plants.

Subsequent process stages are lso fully automatic. Components re first cooled in a salt bath. This nartempering-bath hardening pro-ess offers the advantage of mini-nal dimensional changes and high urface hardness. Any residual races of the carburisation bath on he processed parts are converted nto carbonates, which cause no nvironmental pollution in the waste vater. The quenching intensity of the nartempering bath is continuously nonitored by means of its electron-ically measured and regulated water content.

A cascade rinsing stage next ensures that parts are properly cleaned and that water consumption is reduced to a level at which evaporation is economically justifiable. This enables the complete elimination of waste water. The residual salts which are rinsed off the cooled parts in the first cascade tank are recovered, reducing overall salt consumption.

The Durofer process, which was subjected to practical testing during its development phase, is already in operation at various major users in the Federal Republic of Germany and in several other European countries. Now that the Cecontrol 1 regenerator has gone into large-scale production, Degussa's Durferrit Processes Business Area has begun to launch this system on a worldwide scale.

MEASUREMENT AND CONTROL PRODUCTS FOR DIRECT PROCESS APPLICATIONS

Degussa AG's Measurement and Control Products Business Area is presenting its extended range under the motto "From Chemistry, For Chemistry" to emphasize that the newly developed sensors and measuring systems were thoroughly tested for quality and reliability in the Company's own chemical plants before being included in its product range. The products are largely manufactured by Degussa's branch in Hanau and its subsidiary company Klaus Fischer Mess- und Regeltechnik of Bad Salzuflen, Federal Republic of Germany.

A new optical-fibre sensor system promises to attract particular interest in the field of temperature measuring technology. Inherent advantages of fibre optical systems are their radio frequency immunity, their electrical isolation between input and output as well as their intrinsic safety. Apart from that the new sensing system's operating principle avoids the widespread problem of incorrect readings due to signal attenuation caused by the line or by connectors.

A new pressure transducer which is resistant to high temperatures and corrosive media will also be on display. The pressure-sensitive element is a ceramic diaphragm to which thin-film precious-metal resistors are applied. The high stability of these resistors even at high temperatures and the ceramic diaphragm's resistance to chemicals render the element particularly durable and make the pressure signal largely independent of temperature influences. The device is designed to withstand a fourfold pressure overload. It is particularly suitable for direct linking to the process, i.e. no connecting tubing or transmission media are required. The quality features of the transmitter, with an output signal of 4 to 20 mA, meet the Degussa standard which is based on over 10 years' experience with the TR/TT 01/11 series of electronic head-mounted temperature transmitters.

Two further temperature transmitters have been added to the range. The control room or field-mounted isolating transmitter, commonly used in power station instrumentation, can now also be fitted into connection heads of thermocouples. This unit is designed for ambient temperatures of -50°C to +110°C. As usual with Degussa transmitters, it does not contain any potentiometers and is therefore absolutely maintenance-

free. The TR21 type series has been developed for resistance thermometers subject to less extreme ambient temperatures. One typical area of use is heating, ventilation and air-conditioning technology.

Deguflow gas flowmeters, which have meanwhile become well-established, have undergone further improvement. These units can now measure airflow volumes between 2 and 5000 kg/h on a computer-aided basis. Data is transmitted from the unit to the computer via a standard Rs-232 interface. The Deguflow VT system, specially designed for process technology, is proving highly successful for flow measurements of gases such as hydrogen, noble gases, carbon dioxide and ammonia. The units are calibrated on high-precision systems approved by the Federal German Institute for Physical Testing. These calibration devices can also be supplied by Degussa.

Further exhibits include an "intelligent" sensor system which not only accepts a wide range of measuring signals and transforms them into information in plain text, but also permits -- programmable -- computer-processing of measured signals, resulting in trend or maximum/minimum indications, for example. The hot spot monitor enjoys a special position in the Degussa range of sensors, which comprises units measuring between a few millimetres and several metres in length. It serves as a rupture protection device for high-pressure, high-temperature reaction vessels.

Special intrinsically-safe and explosion-proof temperature sensors, differential pressure measuring and control devices, electronic signal conditioning and processing systems in the form of signal switches on printed circuit-boards or as rail-mounting units, together with regulating valves, complete the range of exhibits at the forthcoming ACHEMA 88 Fair.

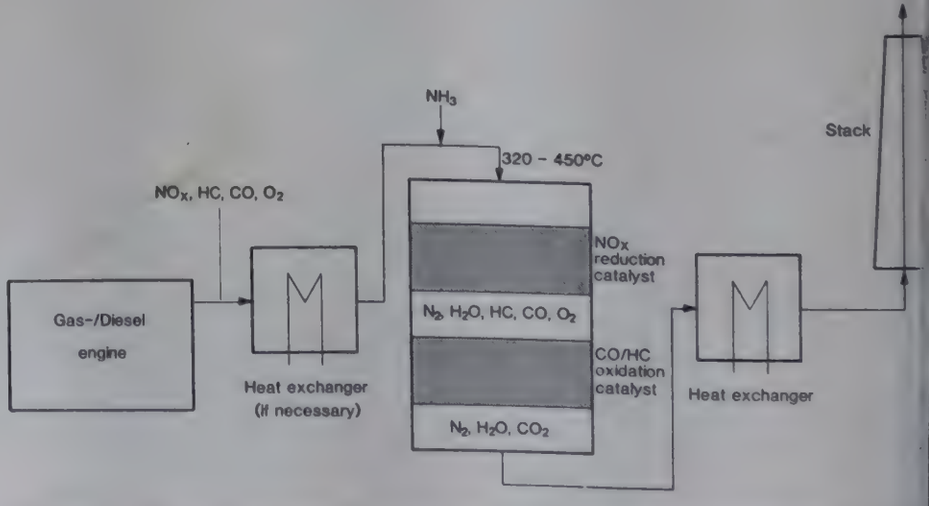
CATALYTIC POLLUTANT CONTROL FOR GAS, GAS/ DIESEL AND DIESEL ENGINES

In the interests of more effective environmental protection emissions from internal combustion engines operating at leaner than stoichiometric ratios also have to be purified. The main toxic substances in the exhaust from internal combustion engines are oxides of nitrogen, carbon monoxide and hydrocarbons. For stoichiometric combustion processes, simultaneous conversion of these gases by a three-way catalytic converter has now become established as the most effective and convenient solution. Unfortunately, the environmental threat presented by lean-burn engines cannot be eliminated quite as easily, since the oxygen remaining in the exhaust makes it impossible to reduce oxides of nitrogen. Another method of removing nitrogen therefore had to be found for this type of engine.

The Selective Catalytic Reduction (SCR) process, which has been applied successfully in Japan for the past ten years, offered the answer to this problem. In this process, the oxides of nitrogen are selecti reduced to nitrogen and water special catalyst, with the aid ammonia. Removal of the remai carbon monoxide and hydrocarb is then relatively simple: th exhaust components are conve into harmless carbon dioxide water on an oxidising catalyst.

At the beginning of 1987, Degussa AG and KRC-Umwellte nik (Environmental Technolo companies formed a consortiu order to be able to offer comp SCR and oxidation emission co systems in the future -- Degussa supplying the catalysts KRC the system components.

The flow-chart given below schematic diagram of a re system of this type: exhaust from the engine is first fed thro a preliminary heat exchanger to it -- if necessary -- to the optim temperature for the catalyst. A cooling, the required amoun ammonia is mixed with the exh gas as homogeneously as poss As it passes through the nitro extraction catalyst, the abo mentioned selective catalytic re tion takes place. The exhaust flows into the oxidation cata which is located in the same cas This catalyst not only converts



REDOX – Exhaust gas emission control system for gas-, gas/diesel and diesel engine

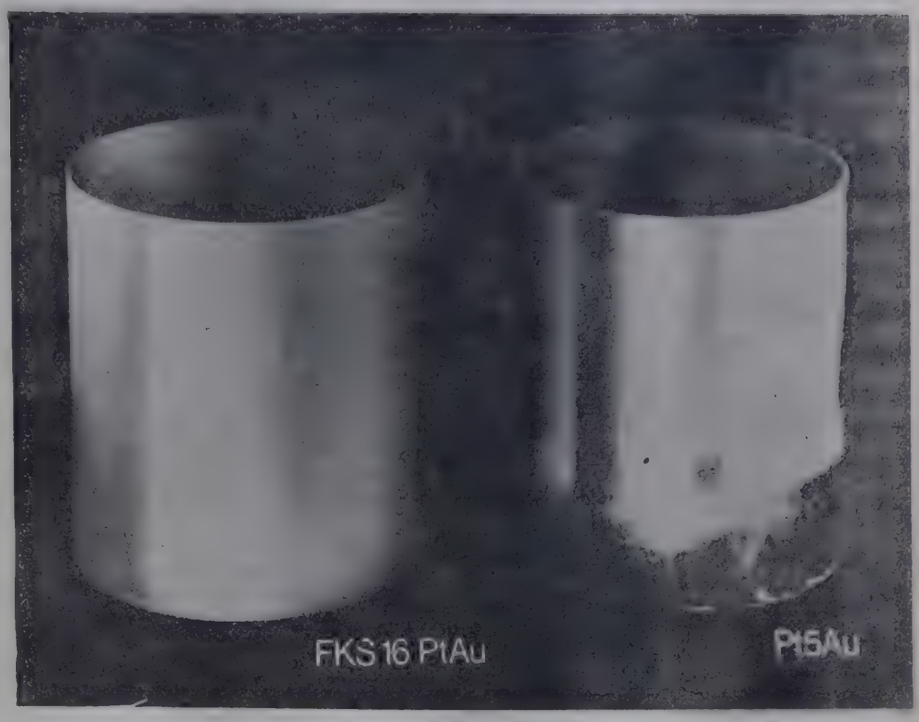
rbon monoxide (CO) and hydro-
rbons (HC) to carbon dioxide
O_2) and water as described
ove, but can also -- as a result of
location after the SCR catalyst
xidise any excess ammonia to
event ammonia salt deposits in
bsequent system components.

In addition to these improvements
process technology, the emission
ntrol concept for internal combus-
n engines developed by Degussa
the basis of its successful
ESONOX process offers further
gnificant advantages. These
clude reduced pressure losses,
wer costs due to the use of only
ne catalyst casing and increased
erating life with lower ammonia
nsumption as a result of optimised
erating temperatures.

ISPERSION-HARDENED LATINUM MATERIALS

The Special Metal Products Bus-
ess Area of Degussa AG, presents
overview of its range of
spersion-hardened platinum
aterials at the forthcoming
CHEMA '88 Fair. These materials,
hich remain resistant to corrosion
aggressive media such as gases
d salt or glass melts even at high
mperatures and which are capable
withstanding high mechanical
ads, are attracting considerable
terest. The Degussa range now
nsists of the fine-grain stablised
pes FKS 16 Pt, FKS 40 Pt, FKS 16
Rh and FKS 16 PtAu.

The dispersion hardening princi-
e used to produce these substan-
s is based on the uniform
stribution of ultra-fine non-metallic
rticles, known as dispersoids, in
e metallic base materials. The dis-
rsoids prevent temperature influ-
ces from breaking down the
esses generated during the infor-
ation of platinum articles. Forming
rdness is therefore largely retained up to temperatures approaching melting point. As a result, articles can be manufactured from FKS platinum materials at a reduced level of platinum consumption and used without supporting elements. Dimensional stability is improved and the risk of sudden cracking eliminated. The articles concerned are also more resistant to corrosive media. Some of these advantages can be illustrated by the visual comparison of two crucibles exposed to the same conditions (see Figure). Despite its thinner walls, the crucible made of the dispersion-hardened FKS 16 PtAu material retains its shape, whereas structural changes in the crucible made of conventional Pt5Au have led to a considerable amount of corrosion damage.



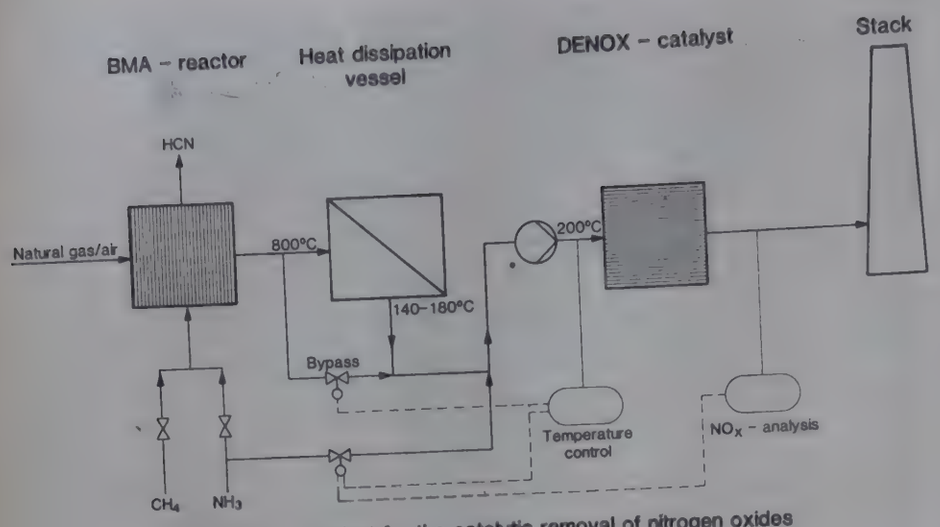
Comparison between a crucible made from the dispersion-hardened material FKS 16 PtAu and a crucible (with thicker walls) made from the conventional material Pt5Au after being used in identical conditions.

The mechanical properties of dispersion-hardened platinum materials depend not only on the degree of dispersion, the constricted size spectrum and the thermodynamic stability of the dispersoids, but also on the percentage of the material they represent. By optimising the dispersoid content, Degussa has improved unalloyed platinum in the form of FKS 40 Pt to such an extent that its high-temperature stability is almost on a par with that of the alloyed material FKS 16 PtRh. In other words, a rhodium-free platinum material of equally high quality is available for all cases in which the alloying constituent rhodium poses problems.

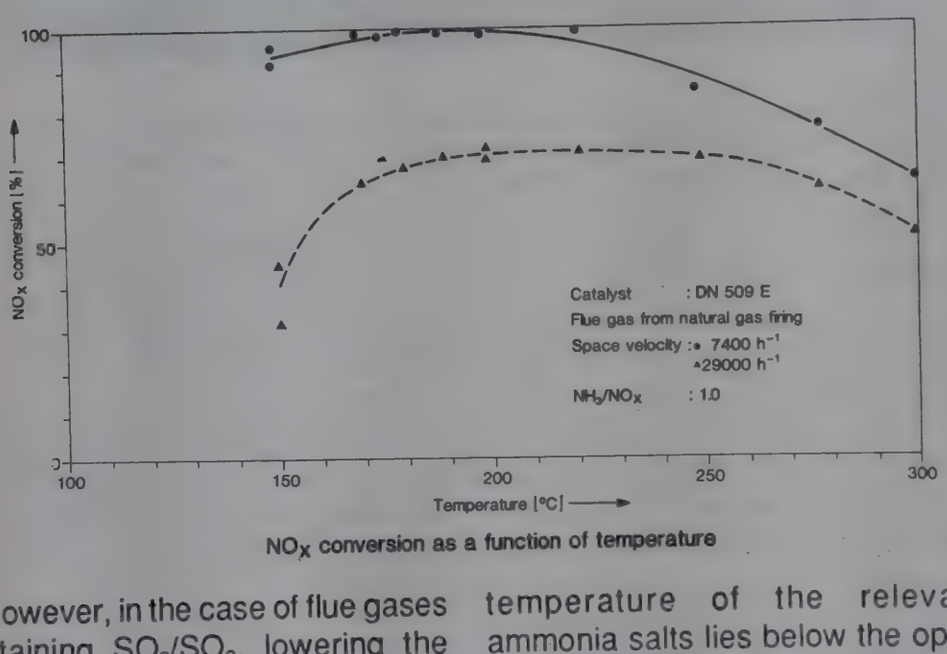
LOW-TEMPERATURE NITROGEN EXTRACTION CATALYSTS FOR PROCESS FIRING SYSTEMS

Ever since catalytic systems for nitrogen extraction from exhaust gases first began to be installed, there has been repeated demand for what are known as "low-temperature" catalysts. This term refers to catalysts capable of eliminating a high proportion of the oxides of nitrogen even at temperatures well below 300°C.

This operating temperature level would above all be beneficial when retrofitting existing plant, in terms of the preferred method of operation and maintenance of the plant's thermal equilibrium.



Flow chart of a plant for the catalytic removal of nitrogen oxides from flue gas in hydrocyanic acid production, using the BMA process



NO_X conversion as a function of temperature

However, in the case of flue gases containing SO_2/SO_3, lowering the temperature in the nitrogen extraction reactor immediately introduces a new problem: deposits of ammonia salts on the catalyst leads to its deactivation, so that regeneration, for example by burning out, becomes essential.

In consequence, catalytic low-temperature nitrogen removal is restricted to gases of combustion containing little or no SO_2. Flue gas of this kind is produced, for example, in gas-fired industrial plant, in which for process reasons its high NOx content cannot be lowered by varying the technical firing conditions. Another potential application is for flue gas from which most of the sulphur dioxide has already been removed, so that the sublimation temperature of the relevant ammonia salts lies below the operating temperature.

Since 1986, Degussa AG has been conducting a pilot experiment in this area. In the experimental plant, oxides of nitrogen are removed from part of the flow of the gas of combustion from a production process (see flow chart). In this process, catalyst tubes in a reactor used to produce hydrocyanic acid are directly heated externally by gas flames; for technical production reasons, it is not possible to lower the flame temperature as a means of reducing NOx emissions. The precious-metal nitrogen extraction catalyst is a new development with honeycomb divisions and an optimum load area at a spatial velocity of 10,000-15,000 h^{-1}.

Results after 4,500 hours of pi scale operation indicate that h rates of catalytic breakdown of oxides of nitrogen occur in a te perature range as low as 180-250 (see Graph). Although the plant h already exceeded 10,000 hours operation, the extraction ra remain extremely high. In the n future, it is intended to build a operate a demonstration plant gain further experience with t technology.

"OPTICAL-QUALITY" TRIALL CYANURATE

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The new product, which is keted as "Optical-Quality TAC" has a purity of at least 99%, is ticularly suitable for use comonomer during the polyme tion of methyl methacrylate and thylene glycol bis-allyl carbo where the polymers have to high visual specifications.

(Further details about the s/products/processes ment herein can be had from Public tions Department, Degussa Postfach 110533, D-6000, Fra 11, West Germany).

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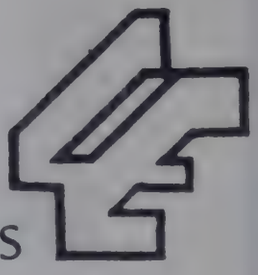

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L.A.S. (Linear Alkyl Benzene Sulphonate) Biodegradability Testing and Environmental Safety Considerations*

INTRODUCTION

The breakdown by the action of micro-organisms (biodegradation) of synthetic compounds which are released to the environment, is important in any consideration of their environmental safety. This is so because the task of establishing the environmental acceptability of a chemical may be greatly simplified if the concentration in the environment, or the period of exposure, is shown to be significantly reduced by biodegradation.

However, care must be taken to ensure that the method used to determine biodegradability, and the performance standard required to demonstrate the environmental acceptability are relevant to the present world.

L.A.S., is probably the surfactant studied with more detail with regards to its environmental safety. The data available, therefore, are very extensive, and in this paper the authors have tried to summarize, from different sources, the most useful, in order to cover all aspects of the environmental acceptability of L.A.S.

BIODEGRADABILITY TESTING

The environmental acceptability of a compound will be judged on the expected concentrations and distribution in the environment and its physico-chemical and biological properties. Since biodegradabilty may influence the levels of materials in the environment, it will form one element of this judgement. Sometimes, consideration of the physico-chemical and biological properties of a compound or its breakdown products will suggest that it may have environmentally undesirable properties.

Biodegradability testing requires exposure of the test compound to bacteria in a suitable medium and the application of some analytical techniques to measure the disappearance of the test compound or the metabolic activity of the bacteria.

The ideal test method selector for the evaluation of biodegradability should reflect the characteristics of the environment to which the results are to be related. At the same time, the selection of the analytical method to be employed should be related, when possible, to the expected environmental hazard. Experimentally this cannot always be achieved and although a wide range of techniques have been developed, the results obtained require careful interpretation.

The tests normally used fall into three main groups.

a) Die-away tests where the test compound is the sole source of organic carbon.
b) Die-away tests where additional sources of organic carbon are present.
c) Activated sludge tests which simulate to a greater or lesser extent that form of sewage treatment.

Just to give an indication of the range of techniques available, the authors have summarized in Tables I, II and III a list of methods most commonly used.

Table I
Biodegradability Testing
Die-away Tests -- No additional organic nutrients present

TEST METHOD
O.E.C.D. Screen
River Die-away Test
British S.T.C.S.D. Test
Treccani Enrichment Test
Closed Bottle Test
Closed Bottle Test (O_2 Saturated)
Sturm CO_2 Production Test
Warburg Test
Zahn and Weliens Test
Laboureur Test.

Table II
Biodegradability Testing
Die-away Tests -- Other organic nutrients present

TEST METHOD
Bunch-Chambers
French Culture Test
S.D.A. Shake Culture Test.

* **Extracted from a paper presented at the "Surfactants & Chemicals Seminar on Linear Alkyl Benzene" organised by M/s. Formokem (India) Corporation.**

Table III
Biodegradability Testing
Activated Sludge Tests

TEST METHOD

O.E.C.D. Confirmatory Test
S.D.A. Test
Swisher Miniature Units
Fischer Activated Sludge Test
W.R.C. Porous Pot Method

The die-away tests of Table I are characterised by the addition of the test compound to a system containing only inorganic salts and relatively few bacteria. Analytically, they are the most flexible, since metabolism of the test compound may be followed by a specific analytical technique or by generally applicable techniques such as D.O.C.

As an example, Figure 1 depicts the biodegradability graphs for both hard and soft anionic standard surfactant, using the O.E.C.D. screening (static) test, and Figure 2 shows the results of the river die-away test using L.A.S. and two branched alkylates (dodecyl and tridecylbenzene).

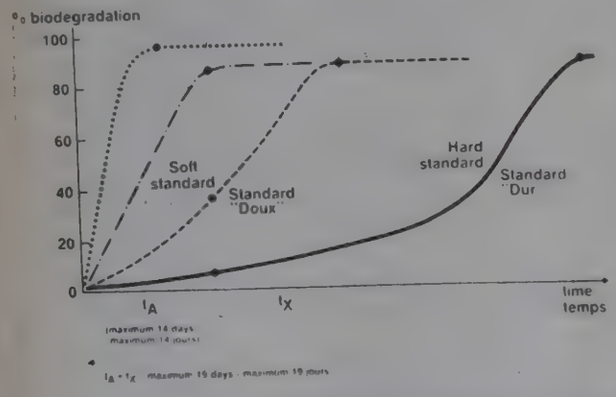


Fig. 1: Calculation of Biodegradability Static Test

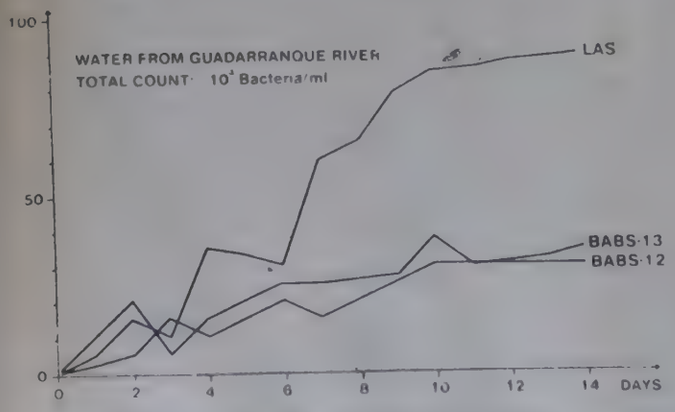


Fig. 2: LAS/BABS-12/BABS-13 Biodegradation River Die-away Test

Tests in Table II have the advantages of being relatively simple to operate and the bacterias are provided with an alternative nutrient source. However, they do not have the analytical flexibility of the group I tests and not quite relevant to practical conditions.

The activated sludge tests of Table III are design to resemble a sewage treatment plant and alternat nutrients are always present. The activated sludge m be developed spontaneously from airborne bacteria, inoculation with sewage effluent or garden soil, directly from a treatment plant.

The diagram of the equipment used in the O.E.C test is represented in Figure 3 and typical resu obtained with the hard and soft anionic standards shown in Figure 4. Figures 5 and 6 represent these b degradability graphs, from two commercial alkylate s fonates; an L.A.S. from P-550 and the sulfonate fr a branched dodecylbenzene.

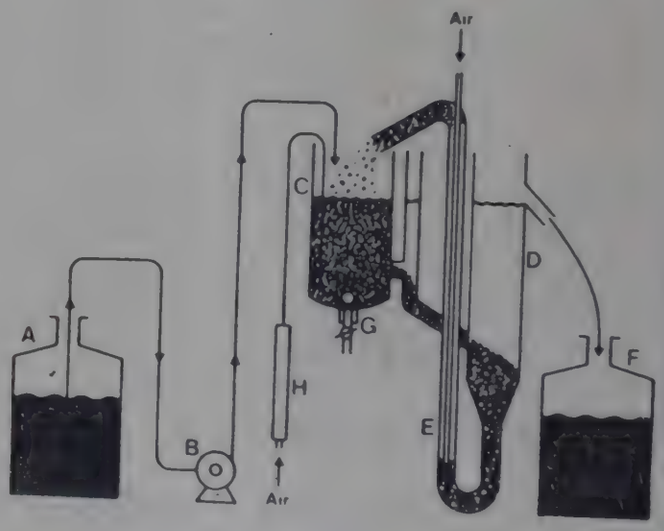


Fig. 3: Biodegradability determination equipment Dynamic Simulation Test

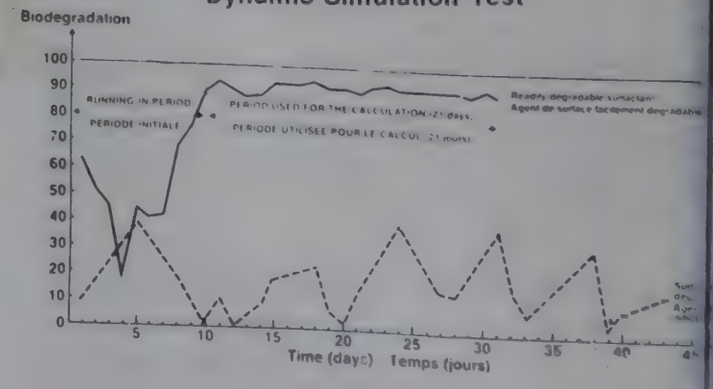


Fig. 4: Calculation of Biodegradability: Dynamic Simulation

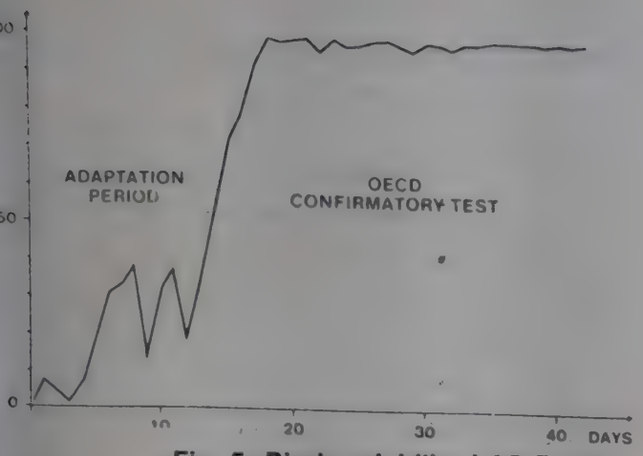


Fig. 5: Biodgradability LAS P-550

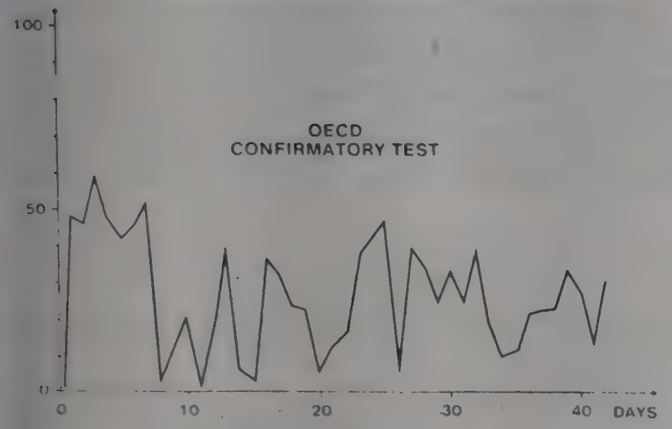


Fig. 6: Biodegradability BABS-12

ANALYTICAL TECHNIQUES

The disappearance of the original surfactant may be ollowed by means of a specific analytical method. Such analytical method for anionic surfactants in particular is based on the reaction with methylene blue (M.B.A.S.).

M.B.A.S. results, however, are conservative, since this nethod is not specific for L.A.S., but also responds to ther materials present in the sample (See Table IV). For that reason it is necessary to use other additional nethods or to develop a specific one when a monitor- ng of a given surfactant is going to be conducted.

Table IV
Biodegradability Testing
Anionics-Analysis
Methylene Blue Active Substances (MBAS)
(not specific for L.A.S.)

M.B.A.S. includes:

* L.A.S.
* Alcohol Ether Sulphates (A.E.S.)
* Alcohol Sulphates (A.S.)
* Alpha Olefin Sulfonates (A.O.S.)
* Sec. Alkane Sulfonates (S.A.S.)
* Methyl Ester Sulfonates (M.E.S.)
* Humic Acid.
* Proteins.

Examples:

* Case A (USA) only 10-20% of M.B.A.S. was L.A.S.
* Case B (UK) only 26% of M.B.A.S. was L.A.S.

For example, the simultaneous determination of M.B.A.S., loss of ultra-violet adsorption due to the aromatic ring, and the production of inorganic sulphate during biodegradation of L.A.S., have provided an indication of the mechanism of ultimate biodegradation of this surfactant.

Figures 7 and 8 show the loss of ultra violet absorption for L.A.S. and branched alkylbenzene sulfonate.

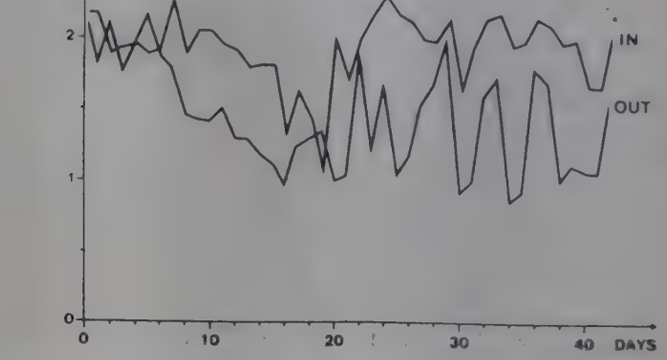


Fig. 7: U.V. Absorbance: BABS-12

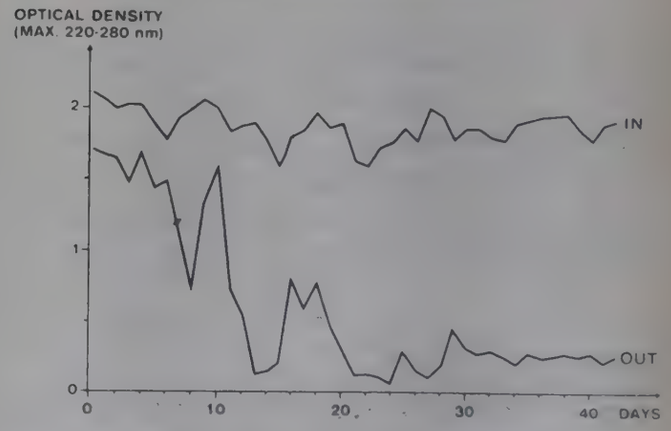


Fig. 8: U.V. Absorbance: LAS P-550

In addition to this, the most sophisticated techniques of measuring the release of $^{14}CO_2$ from a ^{14}C labelled L.A.S. during the biodegradation process will provide a definite convincing evidence of biodegradability, as shown in Tables V and VI.

This technique, however, is obviously not available on a daily basis because of the high cost involved in the preparation and handling of radiolabelled compounds. Today, several chromatographic procedures have been developed to measure L.A.S. specifically in complex samples. For example:

* Micro desulfonation -- liquid chromatography.
* Micro desulfonation -- gas liquid chromatography.

* Microdesulfonation -- G.C./M.S.
* Extraction -- H.P.L.C.

The last technique, in particular, has been successfully used for the specific monitoring of L.A.S. in different environmental scenarios.

Table V

Fate of L.A.S. carbon during simulated secondary waste treatment (^{14}C Alkyl-labelled C_{12} and ^{14}C Ring labelled Commercial L.A.S)

		Fate of L.A.S. Carbon Expressed as per cent		
		To CO_2	In Biomass	Soluble Residue
During simulated waste treatment	Alkyl Carbon	62.0	30.0	8.0
	Ring Carbon	62.0	28.0	10.0
	Total Carbon	62.0	29.0	9.0
During simulated waste treatment & post-treatment exposure	Alkyl Carbon	97.3	2.7	0.0
	Ring Carbon	93.1	5.9	1.0
	Total Carbon	95.9	3.8	0.3

Table VI

Fate of L.A.S. Carbon during simulated secondary waste treatment (^{14}C Alkyl-labelled C_{12} and ^{14}C ring labelled Commercial L.A.S.)

Overall Summary of L.A.S. Biodegradation

	To CO_2	In Biomass	Total
Biodegradation during simulated treatment	62.0%	29.3%	91.3%
Total biodegradation observed to date	95.9%	03.8%	99.7%

BIODEGRADABILITY OF L.A.S. IN SEWAGE TREATMENT UNITS

Several monitoring exercises have been conducted in the operation of different types of sewage treatment units, as far as surfactant elimination is concerned.

Table VII summarizes the information for a specific determination of L.A.S. in four different countries. It shows that about 96 to 99% of L.A.S. entering the plant was biodegraded. The largest fraction of the L.A.S. that was not biodegraded, and thus left the plant, was associated with the sludge.

Table VII

Summary of L.A.S. monitoring activated sludg Treatment Plants

	Average L.A.S. conc. (mg./lt.)		
	Influent	Effluent	% Remo
Canada	2.0	0.09	96
U.S.A.	3.8	0.06	98
Germany	4.8	0.07	99
Spain	7.1	0.20	97

The final concentration on the sludge can be very ferent depending on the sludge treatment type (an robic digestion, aerobic digestion etc.). Table VIII sh the L.A.S. concentrations found in the sludges of ious sewage treatment units, after the digestion op tion.

Table VIII

Measured concentrations of L.A.S. in digest sludge

Location	L.A.S. concentration (g/kg dry s	
	Average	Ran
Switzerland (8 plants)	5.6	2.9-1
United States (3 ")	5.6	4.3-0
Enid, Oklahoma	5.5	—
Germany (8 ")	6.2	1.6-1

BIODEGRADABILITY OF L.A.S. IN ENVIRONMENTAL COMPARTMENTS

L.A.S. biodegradation has been extensively st using different models of environmental situatio well as through a monitoring exercise of the rea degradation kinetics in surface waters, sediment The results are summarized in Table IX.

Table IX

Kinetics for the Ultimate Biodegradation of In various environmental compartment

Test System	Half-Life
River water below sewage outfall	1
River water below sewage outfall plus sediment	
Sediments below sewage outfall	
Groundwater plus subsurface soil	
Soils	
United States	
United Kingdom	
Japan	

ese data indicate that L.A.S. undergoes rapid ulti- biodegradation in all environmental compartments ied. The half-lives found can be compared to those erved for natural substrates such as glucose, cellu- , etc. The test systems shown correspond to the sibilities for an accurate mass distribution of a given duct after a standard treatment (see Figure 9). How- r, it is interesting to mention the particular L.A.S. aviour in these systems, according to the most ent data.

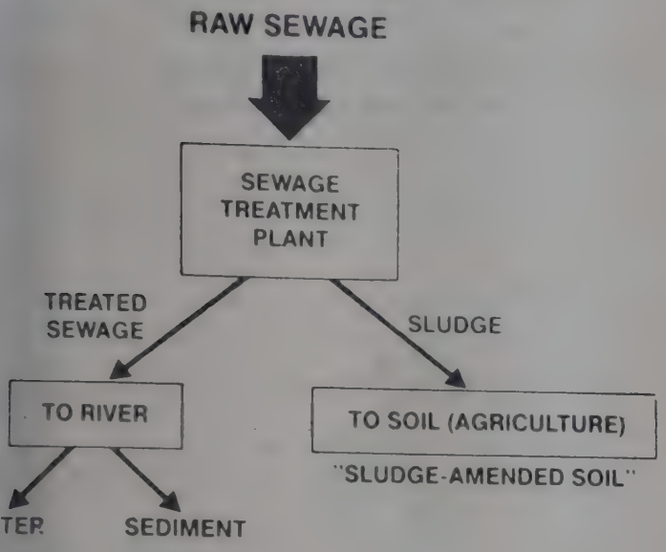
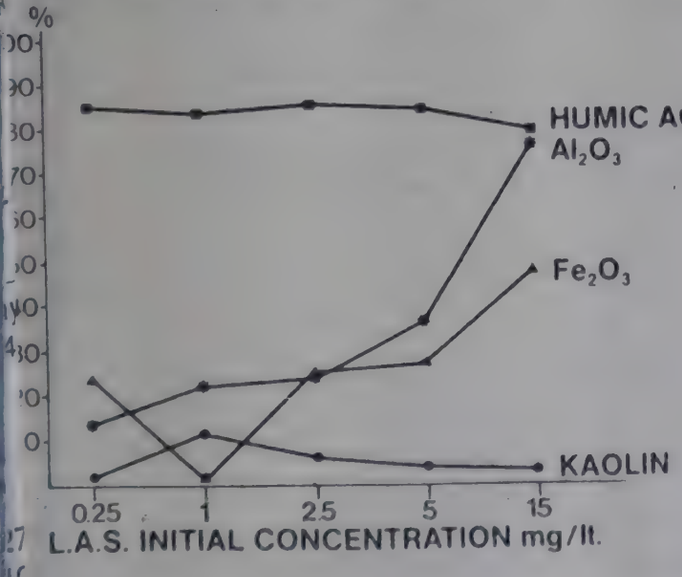


Fig. 9.

L.A.S. in surface waters and sediments: L.A.S. esent in treated sewage discharged into receiving ters will partition between the water and sediment ases. The concentration of L.A.S. in sediment is a nction of a number of parameters, including biodegra- tion, distance from the sewage outfall, dilution and mposition of the sediments. The last parameter is very portant as it can be easily appreciated in Figure 10.



10: Percent Adsorption of L.A.S. by some specific adsorbents at five initial concentrations

The composition of the sediments associated with the presence of organic matter is a most influencing factor, especially in countries where there is a lack of sewage treatment, and therefore, with a predominant direct discharge practice.

Concentrations of L.A.S. in both, the overlaying water and sediment, rapidly decrease with increasing distance from sewage outfall as shown in Figure 11.

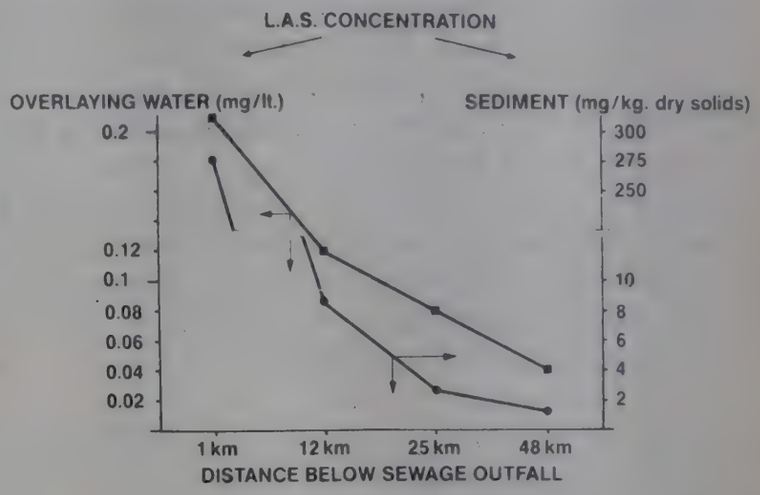


Fig. 11: L.A.S. Monitoring in River Sediment and overlaying water

L.A.S. in Sludge-Amended Soil. Sludge produced in the sewage treatment units can be either used for agricultural purposes or disposed in special areas as land fill. When mixed with soil (sludge-amended soil) for agricultural applications, the concentrations of several pollutants, mainly heavy metals, are obviously of major importance.

In the case of L.A.S. there are a few recent monitoring programmes conducted in Germany and in the United Kingdom using the HPLC method. The soil on which the programme was conducted has a history of several years of sludge application. The measured L.A.S. levels are summarised in Table X.

Table X
Measured Concentration of L.A.S. in Sludge-Amended soil

Location	Concentration (mg/kg)
Germany (3 different locations)	0.9, 1.1, 1.3
United Kingdom	2.2

According to the data of Table IX, L.A.S. concentrations in soil would be reduced by more than 90% after a period of 3-4 half-lives or about 75-100 days follow-

ing application of sludge. In the case of an annual application of sludge to the soil, this suggests that almost all L.A.S. in the soil will have biodegraded by the time of the next application.

AQUATIC TOXICITY

The toxicity of L.A.S. to aquatic life has been the subject of extensive studies and there are a great number of bibliographic references available.

Key results from these references are that the toxicity of L.A.S. to aquatic life increases with increasing alkyl chain length; biodegradable alkylates are more toxic to aquatic life "when intact" than non biodegradable products due to the superior bioavailability of the former; acute toxicity of L.A.S. is in the range of 5-15 mg/lt; transient biodegradation intermediates (metabolites) are from 100 to 10,000 times less toxic than the parent molecules; and ambient concentrations in river waters are well below thresholds for chronic effects.

Figures 12, 13 and 14 summarize these results. It is important to highlight (Figure 14) that as a consequence of the biodegradation process, L.A.S. toxicity totally disappears, while there is always a remaining residual toxicity in the case of branched alkylbenzenes.

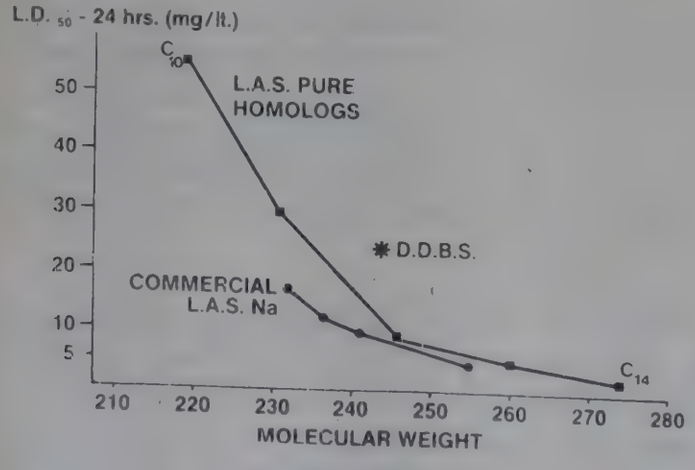


Fig. 12: Acute Toxicity of Commercial L.A.S. Na and Pure L.A.S. Na Homologs to Daphnia Magna

This could create a potential environmental problem since there is a possibility that this residual toxicity will accumulate.

Finally, there are few reports on L.A.S. toxicity to sediment organisms and commercial plant seedlings. (Table XI). Preliminary results of several programmes underway indicate that L.A.S. has no adverse detectable effects.

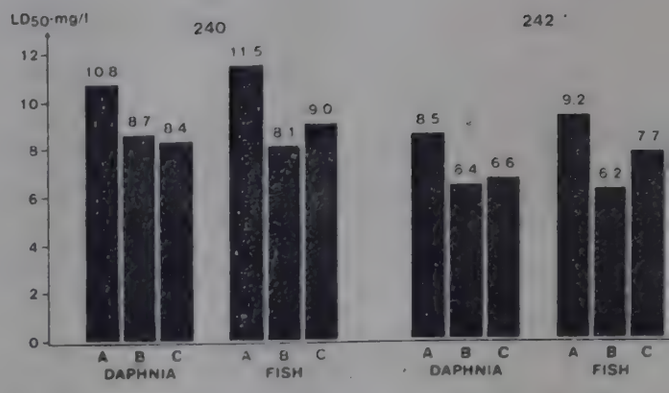


Fig. 13: L.A.S. Aquatic Toxicity Correlation Daphnia vs Carassius (fish) results

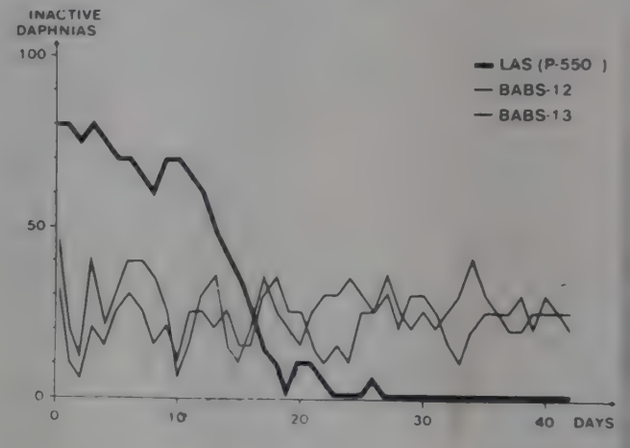


Fig. 14: Acute Toxicity of LAS, BABS-12 and BABS-13 durin biodegradation (Daphnia Magna)

Table XI

Toxicity of L.A.S. to Sediment Biota and Commercia Plant Seedlings

Organism	Results
Benthic midge -- Chironomus riparius	No effect at sediment concentrations up to 500mg/k
Commercial plant seedlings -- barley, radish, pea, cucumber, tomato, lettuce	No effect at soil concentrations up to 0.4 g/m² (2.2 mg/kg).

Therefore, it can be concluded from the information presented that L.A.S. undergoes ultimate biodegradation in surface waters, sediments, ground water and soil at a rapid rate. Ambient concentrations of L.A.S. in surface water, sediment and sludge-amended soil are not a hazard to aquatic or benthic organisms or terrestrial plants. After almost 20 years of extensive use around the world, the safety record of L.A.S. has proven to be one of the most important ones in the surfactant field.

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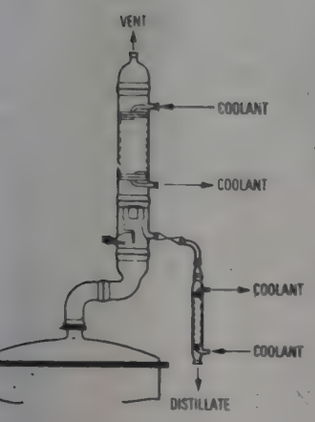

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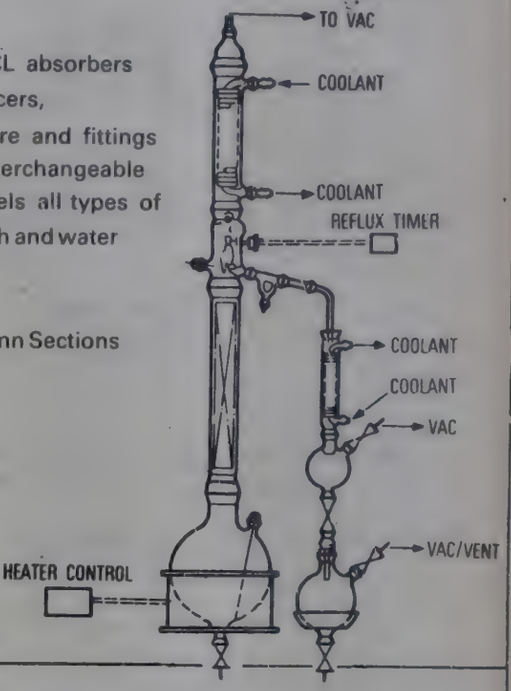

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NEDO will furnish two-thirds of the capital for the new corporation and private business and local public corporations, the balance of one-third. Half the business funds will be derived from the capital and the other half will be financed through the Industrial Investment Special Account and private business.

The planned corporation will build large-scale research facilities intended for creative R&D work based on leading-edge technology. The facilities will be opened to domestic and overseas researchers.

The corporation will start constructing three facilities in fiscal 1988, beginning in April. The first is underground experimental equipment designed to conduct zero-gravity tests for 10 seconds. It will be installed in a shaft of a coal mine located in Hokkaido, the northern main island of Japan.

The second is a technical research center for efficient use of sea life. It will encourage biotechnology research on biosensors and high performance separation membranes etc. It will be located in Shizuoka Prefecture.

The third is an ion-engineering center aimed at promoting research on novel materials and those functioning under extreme conditions by utilizing ion beam-radiation equipment. It will be built in Kansai Science City located between Kyoto and Osaka.

Research Association for Aluminum-Lithium Alloy Planned

A research association for aluminium-lithium alloy will be established by related producers and The Japan Research and Development Center for meals. It will probably be operated by means of MITI subsidies.

Promoters of the new association are calling on domestic aircraft makers — Mitsubishi Heavy Industries, Fuji Heavy Industries and Ishikawajima-Harima Heavy Industries — to join the association. Major promoters are Kobe Steel, Furukawa Aluminium and Sumitomo Light Metal Industries.

It is forecast that aluminum-lithium alloy will soon be applied to fighter planes in the U.S. and Europe. Alcoa, Kaizer Aluminum (both U.S.), Alcan (Canada) and Pechiney-Ugine Kuhlman (France) have installed manufacturing plants for this alloy.

A few Japanese companies — Kobe Steel, Sumitomo Electric Industry and Nippon Kohan — have test-manufactured aluminum-lithium alloy, which, however, has yet to be smoothly put into practical use since Japan's aircraft/space industry cannot compete with its U.S. counterpart with regard to production.

Harima Chem. to expand production structure

Harima Chemicals, Inc., has decided to expand its production structure aiming at next-generation operations.

The company will expand its production capacity for products related to paper manufacture the present 100,000 tons a year to 210,000 tons a year and increase its production capacity for printing ink-use resin by means of an investment of Y1 billion. Work to expand these two plants will be completed within this year.

In addition to the above mentioned plan, as its Tokyo factory as the production base in the Kanto area has already become overcrowded the company is planning to procure a factory site of 33,000 m^2 in the industr complex at Ami Town, Ibar Prefecture.

Thus, the company's produ tion structure is being stead strengthened.

Imports of Primary Petrochemic Products Increase in 1987.

Import results of petrochem cal products in 1987 have bee compiled. Among major impo items, primary petrochemic products such as crude benzen and crude xylene recorded sharp increase supported b buoyant domestic demand. O the other hand, synthetic resin such as polystyrene and poly propylene suffered an allround decrease because of the tigh supply-and-demand positio throughout the world.

Crude benzene registered 55,200 tons, up 87.9% over the previous year, and crude xylene, 84,677 tons, up 772.1%. In addition, propylene registered 14,084 tons, up 40%; pure benzene, 92,406 tons, up 124.8% and vinyl chloride monomer exceeded 40,000 tons, up 125.7%.

In contrast, imports of synthetic resins were in a downward trend. High-density polyethylene, recorded 5883 tons down 61.5% from the preceding year and low density polyethylene 75,235 tons, down 17.9%. Polystyrene showed a decline of more than 50%.

Ohyama Int'l Products to Import Korean Cosmetics

Ohyama International Products, Inc. — a trading company (Head office: Tokyo) dealing in cosmetics — has concluded a cosmetics-import agency contract with Lamy Cosmetics Co., — a leading cosmetics manufacturer in Korea.

New Developments from Japan

nductive And Antibacterial mberg Made By Asahi Chem.

Asahi Chemical Industry Co. s developed a unique bemberg ich is electrically conductive d has antibacterial properties. e product is a world first.

The bemberg fiber contains pper sulfide to give it the ove mentioned properties, ereas in conventional methods pper sulfide has been used for mberg spinning but washed ay thereafter. The new bemrg development followed the mpany's development of a llow-fiber membrane for sepaing out AIDS and other viruses means of application of its mberg.

The new fiber is cheaper than ner equivalents and also has od processability and fastss to washing which carbon er etc. lacks the company ys.

It is suitable, when combined th other synthetic fibers, for e in antistatic clothing, nonoven fabrics, antistatic lining, tistatic films and carpets. In ew of its antibacterial property, can also be used for stocking, ing of shoes, and wallpaper nen combined with wool, synetic fibers or nonwoven fabcs.

Materials For Outer Parts of ace plane Pioneered

National Space Development ency of Japan (NASDA) has veloped three new heat-resisnt materials to be used for the ter parts of a Japanese spacene to be developed under the PE H-II orbiting project. The PE project is aimed at finishdevelopment of a spaceplane by Japanese technology by around the middle of the 1990s.

The three materials are: a titanium alloy with heat resistance of about 500°C, specific gravity of 3.9 lighter than other equivalents; a nickel-based honeycomb panel with heat resistance of 1,000°C and specific gravity of 11.3; a carbon-carbon composite panel with heat resistance of 1,300°C.

Unlike the ceramic tiles used on the Space Shuttles, other parts made of titanium and nickel alloys never come off when a vehicle re-enters the atmosphere. The agency plans to conduct tests, after this April, on the materials used as parts of a unit so that it can design the parts for which the materials will be used. The first launching of the Japanese H-II orbiting plane is scheduled for 1996.

Idemitsu Petrochemical Develops Own A1 Nitride Fine-Powder Technology

Idemitsu Petrochemical Co. has established technology for manufacturing high-purity aluminum-nitride fine powder by means of its own vapor-phase synthesis process.

At present the company is conducting evaluation tests at Hirakawa R&D Center in Performance Polymers Research Laboratory (Chiba Prefecture).

The company will deliver samples from around this summer when evaluation results are to be made public.

Based on these marketing activities, the company intends to set up a bench-scale plant by the end of this year.

At present over 10 companies are compeling in development, of high-purity aluminum ceramics, with their eyes fixed on their high-level electrical characteristics and good electrical-insulating properties.

Idemitsu Petrochemical intends to commercialize the product, using its own vapor-phase synthesis process as a strong point.

EPO May be used as Hemato-poietics For Patients Undergoing Operations

Chugai Pharmaceutical Co., Kirin Brewery Co., and Sankyo Co., have expanded the target of their clinical tests on erythropoietin (EPO) to application of the substance itself to hematopoietics for patients who are scheduled to undergo or who have already undergone an operation.

They have hitherto clinically tested EPO in a bid to market it as a cure for renal anemia but the domestic market for the cure is as small as you 4,000 million a year. If EPO is authorized as the said hemato-poietics, the market scale concerned will rapidly expand.

Surgeons tend not to give transfusions to patients who have undergone operations but require only a transfusion of less than 500 ml of blood. The intention is to prevent infection resulting from a blood transfusion. The three companies expect EPO to be used as hematopoietics for such patients.

EPO has been regarded as a promising biotechnology drug since Amgen (U.S.) succeeded in cloning a relevant gene. Kirin Brewery has established Kirin-Amgen Inc., in the States with Amgen and started clinical trials for EPO in Japan in May, 1986. After that it tied up with Sankyo for EPO operations. Amgen has

called on Food Drug Administration (U.S.) to produce and market EPO as a cure for renal anemia. Johnson & Johnson (J&J) Amgen's licensee — has been clinically testing the same product in an effort to apply it to hematopoietics for the above mentioned patients.

Chugai Pharmaceutical inaugurated in December, 1986 clinical tests on EPO, which the company jointly pioneered with Genetics Institute (GI, U.S.). In addition, the Japanese company has begun independent clinical tests on the same product in the U.S.

Amgen & Chugai Pharmaceuticals GI are engaged in a dispute concerning an EPO patent. The Boston district court has informally ruled that Amgen infringes on GI's product patent covering EPO. It will be interesting to see what counter measures Amgen — who has a related process patent — will take.

Photochromic Pigment Test-Manufactured: Nippon Kayaku

Nippon Kayaku Co. has test-manufactured spiropyran-type photochromic pigment (trade name: Kayact Luminous CIB). When ultraviolet rays are applied to the pigment, it assumes a blue colour. It however, turns back to an original colour when their radiation is interrupted or it is beated.

When 0.1% of the pigment is added to polystyrene, the resultant product is originally almost colorless (Macbeth-illuminometer Value: 0.34) but assumes colour (likewise, 2.12) under given conditions. What is more, it again turns colorless (0.45) when light emitting from a high-pressure mercury lamp (80W) is applied for 0.1 second with the distance between the lamp and and the product set at 80 cm.

The pigment easily dissolves in alcohol, ketone and ester-type solvent but is insoluble in water. It is highly compatible with polystyrene and acrylic resin. When added to these resins, it can show the highest level of photochromic properties.

The company expects the pigment to find its outlet in, for example agricultural-use film.

Boron Nitride-based composite Ceramics Pioneered

Kawasaki Steel Corp. has developed three types of boron nitride (BN) based composite ceramics containing aluminum nitride, alumina and zirconia, respectively. They result from the combining of the company's in-house-developed slip-casting and normal-pressure sintering technologies.

BN-aluminum nitride ceramics feature high thermal conductivity and BN-alumina/zirconia ones are characterized by strong thermal-shock resistance and low thermal conductivity, respectively. All of them have such high BN content that they are imparted with machinable properties.

In producing these ceramics, the company adjusts the sizes of the BN and counterpart-component particles to 1 micron, blends them with binders and dispersants in water and sinters the resultant product under normal pressure. The special technical know-how required is related to and dispersion of all the compo- selection of speciality bi nents.

The production technolog cilites manufacture of mol with complicated forms, ena control of BN addition and suitable for mass productio composite ceramics.

The company will soon b sample deliveries of the cera in the form of parts for gen machinery and jigs for ther treatment.

New Paint said be Resistant Against Gasohol

Nitto Electric Industrial ha developed a new paint easily affected by gasohol — gasoline-alcohol mixture used fuel. When coated with paint, steel products are res tant to ethanol (10%), conta ing gasoline for about 10 yea

Potential applications of t product are fuel tanks and oth steel products. It facilitates sp and steam welding since it co tains electrically conductive f lers. Steel plates coated with t paint can be subjected to pre sing.

The brand-new paint consis of high-molecular phenol res (60-69% by weight), flexib epoxy resin (30-39%), solven additives and aluminum nick particles.

Steel plates lack resistanc against gasohol and, as a resul it is impossible to manufactur gasohol containers from them When conventional-type paint i coated thereupon, the resin con tent of the paint is affected b the gasohol. To date, such con tainers have been produced from for example, stainless

CHEMICAL WEEKLY

SUPPLEMENT ON

LEATHER PROCESSING

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IN INDUSTRIAL SOLVENTS

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- ELECTRONICS
- SURFACE COATINGS
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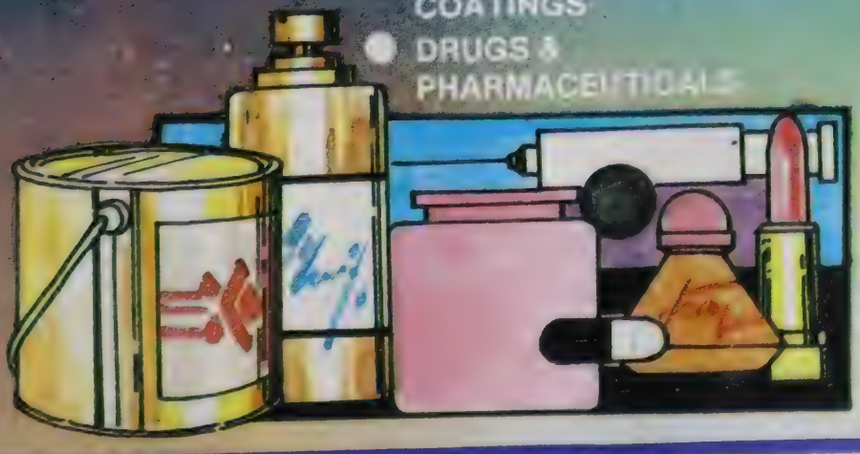

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LEATHER AUXILIARIES -- NEWER PROSPECTS

S. RAJADURAI, G. SAIKUMAR and R.B. MITRA
Central Leather Research Institute, Madras

TRODUCTION

The export of value added products of leather and ther goods has given a new impetus to the use of ther auxiliaries. The recent trends in finishing is not ly to improve the aesthetic appeal but also to bring out many improvements in the intrinsic properties of e final leather which keep changing according to the arket demands.

Therefore the choice and application of the right type auxiliaries is of utmost importance and this creates e necessity to explore and develop newer and spe- al products. The important leather auxiliary chemicals at influence the behaviour of crust are the various pes of fatliquors, retanning materials, pigments, bind- s, filling materials and finishes. All these chemicals so affect the surface properties of the crust which in rn changes the behaviour of finish films. Hence, the resent discussion would be confined to auxiliaries for ost-tanning which form the backbone of producing alue added leathers.

EVELOPMENTS IN LEATHER FINISHING ECHNIQUES AND MATERIALS

The emphasis on top finishing of leathers has hanged from solvent based lacquers to aqueous top oats mainly due to ecological and industrial safety con- iderations. This apart, the current trends in glazed kid eather production demands very soft but at the same me glossy leathers. Similarly for nappa leathers too a emand for glazed upper leathers have arisen. These re but a few example of changing trends which could e met by only altering materials and techniques suit- bly. With this broad perspective in view the newer rends would be analysed.

RECENT TRENDS IN SOME IMPORTANT AUXILIARIES

Fatliquors

Fatliquors assume greater significance in view of their mparting the essential feel and strength properties to he leather, desirable for successful conversion to leather goods, garments and footwear. The export quality leathers are characterised with good durability, light weight, adequate feel, strength, light fastness, resistance to dry cleaning solvents and non-migration of fat at elevated temperatures.

The leather industry looks forward to the development of newer type of substantive type of fatliquors that can produce highly soft tight leathers by deeper fat penetration and uniform distribution. In modern tannery practice, these requirements are practically met with by sperm oil based fatliquors and synthetic fatliquors. Sperm oil based fatliquors have high potential in the production of light, soft non-greasy leathers with waxy feel and special surface effects such as sheen and gloss on leathers. Synthetic fatliquors are highly beneficial on account of their inertness and homogeneous structure and ensure more uniform distribution, high fat fixation and show no migration of fat or spue formation. They suffer from one main drawback as they produce flat leathers with dry and strawy feel. Modern fatliquoring agents, a judicial blend of natural and synthetic multi-component systems designed to meet practical requirements seem to be more appropriate. Sperm oil based fatliquors are unique and versatile in imparting all the above said properties. But the restriction on the use of sperm oil in accordance with the worldwide concern of conserving sperm whale has resulted in the development of several sperm oil replacements viz. jojoba oil (a liquid wax of vegetable oil origin) based fatliquors, oxidative sulphitation of alpha-olefins and synthetic sperm oil composed almost exclusively of esters of long chain alcohols and fatty acids, having composition similar to that of sperm oil. At present, the synthetic esters are very costly and uneconomical, but when the natural product become scarcer, this will become highly handy from a technical and economic point of view.

The development of electrolyte and acid stable anionic fatliquors has introduced many new fatliquoring techniques, has made a breakthrough in the leather making process enabling the fat introduction during the pre-tanning viz. pickling and tanning stages effectively reducing the number of operations with time and energy savings cutting down the number of washes thereby reducing the water pollution. Such modernised proces-

sing technique of incorporation of highly stable fatliquors in pickling and tanning has aided deeper penetration, better uptake and uniform distribution of fat and subsequent uniform uptake of chrome in the leather leading to increased softness, fullness, overall tightness and strength properties in the leather.

Recent R & D works on phosphorylated sulphited fatliquors based on vegetable and marine oil fatliquors have proved more fixation of fat in the leather non-extractable by solvents. The leathers processed with such products are highly soft and tight and are suited for sophisticated leathers like modern uppers, clothing and upholstery leathers.

Water proofness, wash fastness, light fastness of leathers with maintenance of softness are considered highly important for garment leathers. R & D works are directed in these lines to develop complex active lubricants possessing high emulsifier content with reactive groups capable of conferring more bound fat in the leather not tending to solidify and become hard under cold climatic conditions.

Retanning and filling materials

The increasing need for softer type of leathers has created demand for retanning-cum-filling materials that do not load the leather or grain but still produce fuller type of leathers. The point to remember at this stage is that fullness of leathers and lightness are important because the present retanning agent while giving fullness give a loose grain. The newer materials explored in this connection are as follows: (1) Mineral salts with high exhaust behaviour like Cr-Al, Al-Ti, Ti-Cr combinations; (2) Polyurethane based retanning agents -- these may be ionic dispersions in aqueous media or emulsions stabilized by special surfactants; (3) Protein hydrolysate from keratin hydrolysate or industrial wastes after interaction with mono and/or di aldehydes; (4) Polyacrylic resin modification with oils and other monomeric constituents, to give more fullness coupled with tightness.

In the existing material, the interaction of chromium with sulphonated phenol syntan would substantively increase the dye uptake. In respect of white syntan, sulfone and carbamide intermediates needs to be explored more rigorously to produce light fast white syntans.

Pigments

For inorganic pigments many of their covering and resistance properties are dependent on particle size. The advent of particle size reducing devices like Perle m Dyno mill and sieving tools like online microfilters ha made it possible to produce binder free formulation pigments. Use of additives of differing refractive in ces and scattering power have greatly enhanced the u of inorganic pigments for the upgradation of poorer qu ity leathers.

The organic pigments suffered from inherent defec of bronziness and poor solvent resistance. The rece developments in this area overcome this deficiency a colourants that are fast to light have also been deve oped. Vinyl sulphone and acrylamine modified dy which show equal affinities for vegetable and chrom leathers are the other new developments worth me tioning.

Binders

The importance of producing soft leathers demand the application of soft yet tough binders. The acryl binders mosly marketed are only moderately soft an the search for a really soft acrylic binder with good col crack resistance is the need of the hour. Several tech niques in copolymerization behaviour of acrylics can b looked into to prepare such copolymers. Other require ments in respect of acrylic binders are the mechanica stability in view of newer coating techniques that are fas emerging in the leather field.

The protein based binders which form hard films have been softened by use of waxes and additives to be used for soft leathers. Casein binders on modification eithe by grafting of acrylonitrile monomer and acrylic mono mers or by way of esterification and etherification are being tried to meet the requirements of softening the pro tein films.

Polyamide intermediates have opened up the pos sibilities of substituting casein and the results in this direction are encouraging. Polyamides have been suc cessfully tried as syntans and their use as glaze finishes would be possible after due modification.

Polyurethane aqueous based binders are the most recent addition for upgradation of the leathers. These aqueous systems in combination with acrylics and synthetic rubbers provide materials which are far superior in meeting the diverse requirements. The rheological properties of these polymers make them ideal for covering defective Indian cow hides. These materials also have a special role in the finishing of splits and heavily corrected grain leathers. The technologies are rather new and belong to high tech category. The proper

elopment of these systems calls for an indepth study he behaviour of these materials as polymer mix, ulsion stability, adhesion and water resistance.

mpact Finishes

Compact finishes are very ideal for producing finished ther directly in one step. They contain colourants, lub-nts, acrylic binder, polyurethane type binder and aux-ies that are needed to give a full finish film on leather. wever, these type of finishes could not be produced variety of shades and colour variations. These might due to restrictions in using dyes and pigments which incompatible with the various additives and hence ed functional modification. The compact finishes offer uick solution to many of the tanners problems.

p coats

Solvent based conventional NC top coats as lacquers d lacquer emulsions suffer from yellowing despite eeting water resistance specifications. Therefore the e of cellulose acetate butyrate is gaining prominence. other aspect in lacquer emulsion technology is the ergence of emulsions that are dilutable both with ter and organic solvents. Notwithstanding such velopments, the ecological considerations and pollu-n hazards have created demands for aqueous top ats with no or minimum solvents.

Acrylic resin top coats based in aqueous media was t very successful because of poor water resistance countered with these finish. The use of thermosetting rylics with ambient cure is another fast emerging field ich are designed to offset these limitations. The vent of polyurethane in aqueous media for top coat-has changed the scene. These fields when properly blored would give the desired results.

Cosmetic Aids

The cosmetic aids are mostly additive compounds which bring about slippery feel, optical whiteness, optional dullness, waxy feel or other feel modifiers. These add to the aesthetic value and consequently increase the sale value of leathers. The slip agents, shower and fire proofing agents, feel modifiers and sheen agents are a few examples of cosmetic aids. There is as yet no large scale market for these and demand for cosmetic aids are likely to go up with the changing requirements.

The slip agents confer silky feel and smoothness to garment and soft leathers. Silicone emulsions and solutions along with waxes have been in use for slip agents but their effect seem to last not more than a month. Hence there is a need to develop slip agents which would be stable enough on the surface. Shower proofing and fire proofing agents are derived from chrome fatty acid and polymeric binders respectively. These agents are required for speciality use in leather industries.

The sheen agents usually of cationic oils are mostly used for suedes. The current trend requires sheen agents without oiliness associated with cationic oils. The feel modifiers is another field of interest and leathers with buttery feel and waxy feel are currently in demand. These modifiers would go a long way in meeting these requirements.

SUMMARY

The changing trends in leather industry call for the development of newer leather auxiliary chemicals. Such of those chemical currently in use, possible replacement and substitutes to meet the need are discussed in some details.

INDIAN LEATHER EXPORTS

Indian leather exports were 31% higher in the first half of 1987 at $434m compared to $330m in the corresponding period of the year before. At that rate exports for the whole year could have exceeded $1100m. 60% of the total exports last year would be accounted for by leather products. The US, USSR, West Germany, UK, France and Japan together accounted for 62% of exports. West Germany was the single largest-importer of leather garments from India.

-- *Leather*, 190, (4554)

LEATHER ABSTRACTS

WET PROCESS TECHNOLOGY IV -- EVALUATION OF AN ALTERNATE DELIMING AGENT, M.M. Taylor, E.J. Diefendrof, P.H. Givitillo Sweency, S.H. Feairheller and D.O. Bailey, *J. Am. Leath. Chem. Assoc.*, **83**(2) 35, 1988.

This paper describes bench scale and pilot scale experiments with magnesium sulphate and sulphuric acid as deliming agents in the place of ammonium sulphate which results in elevated levels of ammonia in beam house effluent. While this substitution effectively lowered the concentration of ammonia in the effluent, the quality of the resulting leather has been questioned. While differences were found in this resulting leather, modification of the process produced an acceptable product. The chemical and physical changes which occured using magnesium sulphate are compared with data from a standard process developed for converting cattle hides to chrome tanned leather using ammonium sulphate.

ELECTRON BEAM IRRADIATION OF FRESH HIDES, SALTED HIDES AND LEATHER -- MICROBIAL CONTROL AND EFFECT ON PHYSICAL PROPERTIES, David G. Bailey and Michael J. Hars, *J. Am. Leath. Chem. Asso.*, **83**(2) 46, 1988.

This is the first report on the effects of electron beam irradiation on the physical properties and microbial activity on fresh and brine cured cattle hides. The results were similar to those found on treatment of raw skins with gamma irradiation which had earlier been reported by several workers. Samples of fresh hides, brine cured hides and chrome tanned crust leather were irradiated with an electron beam at levels upto 60 Mrads. At a level of 5 Mrads of irradiation microbial activity on fresh hides was eliminated for 28 days. There was a loss in tensile strength as compared to the control. Irradiation of chrome crust leather containing 55% moisture at 20 Mrads caused a severe loss in tensile strength relative to the control. Leather with a 16% moisture content had less damage.

OBSERVATIONS DURING THE CONSERVATION OF FRESH RAW HIDES BY COOLING, A. Hein and E. Heidemann, *Das Leder*, **38**(12) 251, 1987.

Systematic tests concerning the cooling in ice and in the air of hides still warm after slaughtering shows that they cool more quickly in a liquid phase. Besides, co storage in the air is considerably less favourable th if the skins are packed in plastic material or stored water. More so if bacteria develop they do so alwa on the flesh side.

FINISHING WITH RADIATION CURING, Frantz Scho nik, *The Leather Manufacturer*, **106**, (1) 9, 1988.

This paper presents the results on the use of ra ation curing with ultraviolet light or electron beams leather finishing. The coatings are applied by conve tional methods and undergo rapid cure to give produc with excellent properties. There is a good potential f extending the benefits of energy savings and freedo from air pollution to the leather industry.

PREPARATION OF SOLUBLE PROTEINS FRO WOOL, H.H. Mies and Zahn, *Das Leder*, **39** (1), 1, 198

A method to prepare S. Sulfokerateins starting wi wool tops by oxidative sulfitolysis or by mercaptoly is presented. 64% of the low sulphur keratins in wo were isolated as sulphokeratins by isoelectric preci tation. The first fraction contained small amounts of hi sulphur and/or glycine-tyrosine rich wool proteins. The can be separated on Sepherdex G-75 or Sephacryl 200 Superfine. The precipitated low sulphur S-Sulph keratins were reduced to SH Keratins and subsequen fractionated into five components by electrophoresis. order to estimate S-Sulphocysteine content, the sulph residues were set free from the low sulphur S. Sulpho eratins. 8.6 mol% have been found whereas S-Carbox methyl keratin-A conventionally prepared (18.25) c contain 6 to 6.4 mol% half-cystine only.

PRESERVATION OF ELEPHANT AND HIPPOPOT MUS HIDES, I.B. Leach, *Leather*, **190.** (4554), 79, 198

This paper describes the method of preservation elephant and hippopotamus hides. The flaying of t elephant was conducted on one side of the animal a time and the hide was removed in smaller piec called panels. These included four leg panels, two sid four ear panels, a belly, tail, head and trunk. Pres vation was a conventional salting technique. The pan were upto 25mm thick and exhibited 77% salt satu tion after 4 days. The procedure for the collection a

eservation of hippopotomus hides are essentially the ame as those used for elephants. The thickness was ound 35mm and there was 63% saturation of salt as ompared to 90% salt saturation of cattle hides after 24 ours. The level of salination was improved by drying e salted hides.

LL AQUEOUS FINISHING SYSTEMS FOR LEATH-RS -- PROBLEMS AND SOLUTIONS, Werner Valther, *J. Am. Leath. Chem. Assoc.*, **83** (3) 74, 1988.

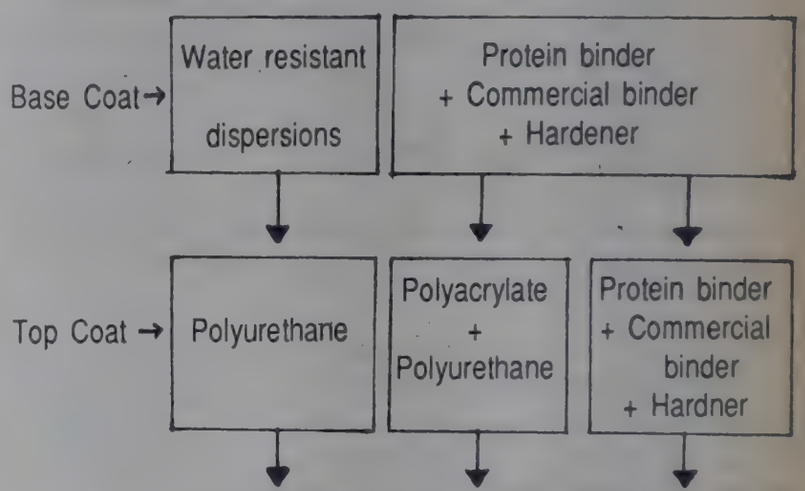
The numerous criteria and requirements for aqueous r hydrofinishes for leather are discussed in this paper. hey include:

- Applicable as universally as possible and rational for use with all normal leather types, comparable to organic systems.
- Practicality of application.
- High processing and end-use fastness properties.
- Good wearing and hygenic end-use properties.
- Elegant, fashionably attractive appearance of the finished product.
- Ecological requirement in the widest sense of term.
- Non-flammability of the products.
- Non-hazardous from an industrial hygeinic standpoint.
- Commercial aspects as favourable as possible.

WATERBORNE COATINGS BASED ON DIFFERENT FILM FORMING POLYMERS, D. Lach, I. Knoll and K. Fischer, *J. Am. Leath. Chem. Assoc.*, **83**, 87, 1988.

Enforcement of Government regulations will make the use of lacquers based on organic solvents, difficult in the future. Hence water borne coatings have therefore to be used for finishing and top coating leather without impairing the physical properties and the appearance of the finished leather. This paper describes some of the results obtained by using a combination of acrylic and casein binders in conjunction with the new highly effective cross linker.

The results are summarised as follows:



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NEW PRODUCTS

NEW FINISHES FOR LEATHER

Stahl Finish Co. has offered the following three new finishes:

FI-909: This is a novel oil composition that imparts water resistance on many crust leathers.

TPW-6500 Series: These are water based transparent pigments that have brilliance and brightness. They have good to excellent UV and thermal resistance, and are technically superior in performance to many of the new solvent based dyestuffs and are recommended for high quality aniline leathers. They are particularly well suited for adjusting colour when water based topcoats are employed.

RA-1711: This is a unique acrylic resin. It possesses an unusual property balance and has excellent low temperature flexibility along with acceptable plate release properties. The resin is very soft, and exhibits minimal load sticking.

PU CROSS LINKER FROM BAYER

Bayderon Fix PCL is a new finishing auxiliary which improves wet-fastness and in particular the wet rub fastness, of films made of dispersions of crosslinkable polyurethanes. It takes 4 to 8 days for the product to become fully effective, depending on the drying temperature and the duration of the drying.

-- *Leather,* **190,** (4554), 1988.

NEW SYNTHETIC FAT LIQUOR

Atlas Reifenery Inc. has developed Atlasol WRP, a new synthetic fat liquor designed to produce low extractables and very soft leathers. Specific applications include side leather for water resistance when appli in combination with chrome fatty acid complexes a used alone on normal shoe uppers for a full and s leather. It will impart an excellent handle and softne on sheepskin garment leathers as well.

-- *Leather,* **150,** (4554), 198

PRODUCTS FROM BASF

Densodrin-S: Densodrin-S is lightfast and is suitab for use in water repellent finishes on white and other pa coloured leather and for skins. It has virtually no bleach ing effect when applied to aniline leather. It has also plasticising effect and a further advantage is that th water-resistant finish produced by it does not impair th wettability of suede leathers. It is fully miscible with wate and is resistant to compounds formed by mono valer ions as well as divalent ions present in hard water. is also compatible with anionic tanning agents, fat liquor and dyes, providing the pH is above 4.5.

Relugan RF: Relugan RF is selectively bound by the skin tissue. It may be used for chrome tannages and retannages. It makes better fixation possible and allows the chrome liquour to be exhausted to a greater extent

CORIAL MATT LACQUER CM

Corial Matt Lacquer CM is a top coating agent. It forms a silky matt finish that cannot readily be repolished. It imparts a smooth pleasant handle to the leather and has good fastness properties. Unlike nitrocellulose finishes it does not yellow on exposure to heat and/or light. It is also resistant to amines that are extruded from polyurethane foam that has been insufficiently aged.

-- *Leather,* **190,** (4554), 1988.

LEATHER NEWS FROM ABROAD

OOTWEAR IMPORT BY US

United States trade statistics published by the epartment of Commerce in America show that imports non-rubber footwear continue to increase along with e overall trade deficit. In January, non rubber footear imports totalled 82 million pairs, compared to 75 illion pairs in January 1987, representing an increase 9.1%. This brings import penetration to a record of 5%. (*Shoe Leather News,* (3746), 1988).

LOBAL REPORT ON LEATHER & FOOTWEAR

According to UNIDO's Industry and Development Global Report 1986, the short term output of leather nd leather products in developing countries is expected increase by 2.8% in 1986 and 1.7% in 1987. This is major improvement over the period of negative growth etween 1978 and 1984. In the developed countries it expected to increase by 1.7% in 1986 and 1.2% in 987, recovering from the fall of 1.8% in 1985. The appliation of computer assisted design and manufacturing ystem (CAD/CAM systems) has helped to make leather nd leather goods production in developed countries ore efficient and developing countries will need to nprove efficiency in the industry if they are to remain ompetitive.

The output of the shoe industry in developing counes is expected to increase by 3.6% in 1986 and 3.1% 1987. This continues the recovery from 1982-1983. developed countries the growth in shoe output is pected to be 0.7% in 1986 and 1.2% in 1987, thus nding a period of five years of negative growth. The erage price of shoes imported by developed countries m developing countries was half the price of domesally produced shoes. Thus it is clear that developing untries have a marked competitive advantage in the ass production of shoes in the low range. (*Leather in sia,* **3** (1), 1988).

EW FISH SKIN

Dan-cod of Esbjerge, Denmark, producers of wet lted fish products and tanned fish skins, are to launch a new skin in the European market under the brand name Sirene skin. *Lupus anarichas* is a deep-sea fish living in the North Atlantic and consumed in Europe and the U.S. Apart from being attractive, the skin is remarkably strong and it will be available in a wide range of colours for the leather goods industry. (*Leather in Asia,* **3** (1), 1988.

STAHL'S APPLICATION LABORATORY

Stahl Chemicals have provided practical assistance in finishing to tanners and shoe manufacturers in Pakistan by the opening of a new application laboratory in Karachi. The laboratory was facilities to provide a high level of local service and is backed by Stahl's wide knowledge of international fashion needs and finishing standards. The technical assistance also includes running trials on customer samples, solving individual finishing problems and developing special fashion finishes. Covering a floor area of 120 sq. mtr. the new laboratory has been equipped with uptodate machinery to take advantage of the latest finishing technology. (*Leather in Asia,* **3** (1), 1988).

NEW EFFECTS ON SKIN

The Ceasare Francesclin Company has proposed a series of articles for the production of footwear and leather goods, that was decidedly interesting from a fashion content point of view. The effects which are particularly noteworthy are, a laminated pale print, a shiny black floral pattern and a number of satin effects in unusual colours. They are particularly soft skins which lend themselves to a wide range of interpretations. (*Fotoshoe,* 15, **13** (12), 1987).

PAKISTAN'S LEATHER TRADE

Pakistan leather garments exports have catapulted over the last couple of years growing from Rs. 98 m. to 342 m. in 1986-87. Main markets are West Germany and other European countries although the Far East is increasing in importance as a customer.

Break-up of export performance is given on Page X

STATISTICS

EXPORT TARGETS FOR 1987-88 SET AGAINST EXPECTED RESULTS FOR THE SAME PERIOD (Rs. Million)

	Target	Forecast Result
Semi-finished Leather	500	400
Finished Leather	3500	4000
Footwear	1290	1300
Footwear Components incl. uppers	2980	3200
Leather Garments	800	900
Leather Goods	1000	1500
Total	**10070**	**11300**

MAIN MARKET FOR INDIAN EXPORTS OF FINISHED LEATHER (Value in Mil. Rupees)

	1984-85	1985-86	1986-87
Italy	383	438	595
FRG.	357	383	523
USSR	619	384	491
USA	280	291	313
UK	217	210	281
France	269	249	236
Total	**21250**	**19550**	**24390**

Leather, **40**, (4554), 1988.

INDIAN RAW STOCK SITUATION 1986 (Million Head)

Cattle	201.39
Goat	110.99
Buffalo	52.05

EXPORTS OF LEATHER AND LEATHER PRODUCTS FROM INDIA (in Million Rupees)

	Apr.-Nov. 86	Apr. Nov. 87	% increase
Semi finished leather	110.60	184.10	54
Finished leather	2473.97	2996.78	20
Leather footwear	384.95	729.35	89
Footwear components	1561.76	2039.12	31
Leather garments	323.97	625.50	93
Harness & Sadllery	486.79	650.11	34
Others	135.67	153.07	13
Total	**5486.72**	**7378.03**	**34**

EXPORTS OF LEATHER AND LEATHER GOODS FROM PAKISTAN (Values in million dollars)

	1982-83	1983-84	1984-85	1985-86	1986-87	Increase over 85-86
Finished Leather	93.9	145.7	153.1	179.7	237.2	3.2%
Leather Garments	7.8	13.5	22.4	44.7	67.5	51.0%
Leather Gloves	13.9	19.4	26.1	33.5	35.0	4.4%
Leather Footwear	4.9	5.1	9.3	4.4	4.1	-6.8%

MARKET INFORMATION

Chemicals Steady

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

A fairly even trend was noticed in the Bombay chemicals market during the week under review. There was a slight fluctuation in the prices of Acrylamide and Citric Acid (Indian), the former was traded at Rs. 89 while the latter was quoted at Rs. 42.50. Marginal differences were noted in the prices of solvents, while dyes intermediates came in for some active trading.

The prices of dyes exhibited no change.

(Prices as on 18th May 1988)

INDUSTRIAL CHEMICALS	Per kg.
Ammonium sulphate	2.00
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	12.00
Ammonium carbonate (Di)	17.00
Ammonium bicarbonate	4.75
Ammonium chloride	3.00
Ammonium nitrate	3.50
Arsenic white powder	21.00
Acrylamide (Resale)	57.00
Barium carbonate	6.00
Bleaching powder (33% Cl)	3.80
Borax (Granular)	15.00
Borax (Powder)	15.50
Boric acid (Tech.)	21.00
Bisphenol-A	45.75+ST
Butyl carbitol	35.00
Caustic soda (Flakes)	8.00
Caustic soda (Solid)	7.60
Caustic soda (Lye)	6.00
Calcium chloride 70% (solid)	3.25
Calcium chloride 75-80% (fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium Carbonate PPT	3.00
Calcium carbonate (Activated)	3.55
Camphor (Indian)	82.00
Cresylic acid	50.00
Cream of Tartar (Tech.)	64.00
Citric acid (Belgium) (Resale)	44.00
Citric acid (Indian) (Resale)	42.50
Copper sulphate	17.50
Chromic acid	50.00
Cyanuric chloride	120.00
Cobalt oxide	280.00
Carbitol	50.50+ST

Dicalcium phosphate (Anhydrous)		16.00
Ferric Chloride (Lumps)		7.00
Ethylene urea		56.00
Glue flakes		8.45
Glue sheets		6.75
Gohsenol GH-17		89+ST
Hydro	(Resale)	38.00
Hyflosupercell		20+ST
Hexamine	(Resale)	35.00
Industrial Wax		25.00
Litharge		15.00
Lead Acetate (Tech.)		28.50
Lithopone		15.50+ST
Magnesium chloride (crystal)		1.80
Menthol crystal (Flakes)		185+Ex.+ST
Menthol bold		205+Ex.+ST
Menthol crystal bold		245+Ex.+ST
Magnesium carbonate (Japan)		16.00
Magnesium carbonate (Indian)		15.00
Maleic Anhydride (per kg)	(Resale)	45.00
Mercury (75 lbs.)		9,000.00
Nickel chloride		90.00
Oxalic acid	(Resale)	20.00
Peppermint oil (Rectified)		90+Ex.+ST
Potassium carbonate (Indian)		19.00
Potassium carbonate (Imported)		21.00
Potassium bichromate		22.00
Potassium phosphate (Mono)		14.00
Potassium phosphate (Di)		14.00
Polyvinyl alcohol (No. 117)		88.00
Polyvinyl alcohol (No. 173)	(Resale)	94.00
Polyvinyl alcohol (No. 208)		78.50+ST
Paraformaldehyde	(Resale)	21.00
Phthalic anhydride 36%	(Resale)	24.00
Pentaerythritol	(Resale)	51.00
Paraffin wax	(Resale)	14.50
Rongolite (German)		70.00
Rongolite (Czech.)		50.00
Sodium sulphate (Fine)		6.00
Sodium sulphate (Coarse)		5.00
Sodium sulphide 50-52% (Flakes)		8.00
Sodium sulphide 58-60% (Flakes) (TCL)		21.00
Sodium sulphide pure (Flakes)		12.25
Sodium nitrite	(Resale)	16.00
Sodium chlorite 30%	(Spain)	94.00
Sodium chloride 50%	(Spain)	81.00
Santobrite (Indian)		36.00
Soda Ash (Tata)		4.00
Soda Ash (Birla)		3.80
Soda Ash (Imp.)		3.50
Sodium bicarbonate		5.25
Sodium bisulphite		4.50
Sodium silicate		3.00
Sodium acetate		6.00
Sodium alginate		108+ST
Titanium Dioxide (Anatase)		50+ST
Titanium Dioxide (Rutile — RCR_2)		69+ST
Tartaric acid (Crystal)		94.00
Trisodium phosphate		4.80
Thiourea		68+ST
Urea (Tech)		2.75
Vacuum salt		1.00
Zinc Dust		30.00
Zinc Oxide		30.00
Zinc chloride powder (technical)		14.00
Zinc sulphate		4.00

SOLVENTS		Per kg.
Acetic Acid (Glacial)	(Resale)	13.35
Acetic Anhydride	(Resale)	30.00
Acetone	(Resale)	13.50
Adipic Acid		51+ST
Aceto Acetanilide		50.00
Aniline Oil	(Resale)	42.00
Benzoate Plasticiser		33.00
Butyl Acrylate		108+ST
Butyl acrylate		95+ST
Butyl stearate		36.00
Butanol	(Resale)	34.00
Benzyl chloride		24.00
Benzo trichloride		16.00
Benzoyl chloride		22.00
Bromine Liquid		42.50
Chloroform		24.50
Carbon Tetrachloride		13.00
Cellosolve		42+ST
Cyclohexanone		50+ST
Cyclohexanol		43.00
Diacetone	(Resale)	35.00
Diethyl Oxalate		34.00
Diethylene glycol (DEG)		36+ST
Dioctyl Phthalate		52.00
Diallyl Phthalate		56.00
Dimethyl Phthalate		28.00
Dioctyl Adipate		52.00
Dibutyl Adipate		42.00
Dipentene		15.00
Dimethylamine 40%		12.00
Dimethylamine 60%		14.00
Ethyl Acetate		20.50
Ethyl Acrylate		46.00
Ethylene Dichloride		11.00
Ethylene Glycol		23.25
Formic Acid (Imp)	(Resale)	26.50
Formaldehyde	(Resale)	7.75
Glycerine (CP)		50.00
Glycerine (IW)		49.00
Hydrogen peroxide 50%	(Resale)	28.50
Isopropyl Alcohol		17.50
Iso Butyl Alcohol		28.00
	(Resale)	30.00
Monoethanolamine	(Resale)	49.00
Melamine		48+ST
Methyl Ethyl Ketone		43.00
Methyl Isobutyl Ketone		36.00
Methyl Acrylate		42.00
Methyl Dichloride	(Resale)	23.00

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Meta Cresol	45.00
Nitrobenzene	17.00
Nitric Acid (Con.) (RCF)	2.50
Ortho Cresol	30+ST
Phenol (Resale)	30.50
Propylene Glycol	33.50+ST
Polyethylene Glycol (No. 200)	37.00
Polyethylene Glycol (No. 400)	40.00
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethyene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	44+ST
Sorbitol	18.50
Sulphuric Acid	2.10
Trichloroethylene	27.00
Triethanolamine (Resale)	49.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	41.00

SOLVENTS	Per Litre
Benzene	10.00
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.25
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	11.00
Xylene	14.50

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)	
Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	170.00
Aceto Acetic Ester (Methyl)	63.00
Ammonium Molybdate	180.00
Anthraquinone	70.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	125.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	58.00
Benzidine Dihydrochloride (BDH)	80.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	56.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	116.00
2, 4, DNCB	26.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	58.00
Diethyl Aniline	160.00
Di-amino stilbene disulphonic acid	118.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	57.00
Isophthalic Acid	40.00
J. Acid	255.00
J. Acid Urea	275.00
K. Acid	95.00
MDPS (German)	200.00
MNA	80.00
Meta Unido Aniline	140.00
MPD (Local)	120+Ex+Tax
MPD (Japan)	200.00
Naphthenic Acid	12.00
N-Methyl J. Acid	380.00
N-Methyl Aniline	115.00
Naphthalene (Refined)	21.00
Naphthalene (Refined)	23.00
Ortho Anisidine (OA Imp.)	85.00
Ortho Dichloro Benzene (ODCB)	11.25
OT Base	95.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	87.00
PNA	68.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	130.00
PNCB	28.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	118.00
Phenyl J. Acid	350.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhodulline Acid	490.00
Resist Salt	20.00
Resorcinol	140.00
Sodium Naphthionate	65.00
5-Sulpho-Anthranilic Acid	60.00
Sulphanilic Acid	25.00
Sulpho Tobias Acid	105.00
Trichloro Benzene (TCB)	15.00
Tobias Acid	116.00

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Bombay dyes market

(Prices as on 18th May 1938)

ACID COLOUR	Per Kg.
Acid Violet 4BS	143.00
Acid Maroon V	110.00
Acid Orange II	77.80
Acid Orange IIY	63.05
Acid Red A	107.25
Crosein Scarlet MOO	155.00
Acid Scarlet 3R	99.90
Acid Red 38N	135.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Green V	230.00
Acid Patent Blue AS	250.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	121.95
Acid Black BX	98.40
Acid Black Wax	135.50
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

DIRECT COLOURS	Per Kg.
Yellow 3GX	88.10
Gun Yellow RCH	124.00
Fast Yellow GCH	141.15
Yellow CFG Hly. Conc.	312.00
Fast Yellow GS	111.65
Fast Yellow CHRS	95.45
Viscose Orange A	166.15
Fast Orange GR	133.75
Red	96.90
Dark Tan	78.25
Red IIR	72.55
Red 4B	169.10
Bordeaux BW	132.30
Fast Scarlet 4BS	166.55
Red 12B	170.55
Bordeaux Hly. Conc.	194.00
Cotton Red N	117.05
Brill. Fast Helio B	278.00
Brill. Fast Helio 2B	297.00
Brill. Fast Helio 2RS	136.20
Brill. Fast Helio BS	116.10
Brill. Violet Extra	126.40
Blue 2B	86.60
Blue G	170.50
Sky Blue FB	188.25
Copper Blue GR	147.00
Fast Greenish Blue GL	114.60
Developed Black BT	116.10
Blue NB-2R	300.20
Blue NB-2BC	185.30
Developed Black NB-GHB	185.30
Green B	111.65
Green NB-B	188.25
Green 2B-N	188.25
Brown MR	154.40
Brown CN	107.25
Golden Brown G	140.35
Catechin G	120.50
Omega Tan	126.40
Catechin GS	102.80
Black E Hly Conc.	142.60
Black E Extra Hly. Conc.	142.60
Black NB-ER Hly. Cone.	310.50

DISPERSOL COLOURS	Per Kg.
Yellow 6G Powder	143.80
Red B 3B Powder	247.80
Red B 2B Powder	323.20
Red CB Powder	439.15
Red D2B Powder	477.40
Violet C 4R	521.90
Blue BG Powder	235.45
Blue BN Powder	103.75
Blue D 2R Powder	476.25
Navy BT Powder	243.90
Blue B 2G Powder	210.20
Black BT Powder	182.60
Blue BR Powder	390.20
Yellow 7GL	338.60
Yellow 5RX	218.80
Yellow 3G	367.25
Yellow	140.00
Yellow AL	135.30
Yellow Brown REL	247.50
Yellow FFL	463.60
Gold Yellow GG	259.70
Pink REL	247.00
Red REL	468.65
Red 2B	327.40
Red FB	324.20
Red Violet FBL	469.85
Orange 3R	196.65
Violet 3R	280.00
Violet RL	275.45
Violet 6R	485.75
Scarlet RR	214.80
Rubine 3B	223.00
Rubine CB	364.90
Blue GL	318.90
Blue BGF	636.50
Navy Blue RF	270.40
Brown 3REL	200.40
Black GEL	324.20
Dark Brown 3B	317.40

BASE COLOURS	Per Kg.
Fast Yellow GC	80.20
Fast Orange GC	135.45
Fast Scarlet R	166.90
Fast Scarlet RC	126.65
Fast Scarlet RCR	99.05
Fast Scarlet G	121.65
Fast Scarlet GN	91.50
Fast Scarlet GG	72.70
Fast Scarlet GGS	72.75
Fast Red B	203.20
Fast Red RC	119.15
Fast Red R Flakes	149.25
Fast Red TR	166.80
Fast Red TR Oil	183.15
Fast Red RL	237.10
Fast Red KB Oil	201.90
Fast Bordeaux GP	201.95
Fast Garnet GBC	94.00
Fast Violet B	505.60
Fast Blue BB	521.40

NAPHTHOL COLOURS	Per Kg.
ASG	217.00
AS	143.00
ASSW	279.75
ABBS	189.15
ASBO	195.65
ASD	175.50
ASOL	179.35
ASTR	279.75
ASPH	279.75
ASE	196.05
ASEI	184.40
ASLB	1632.60
ASBT	1817.00
ASWG	143.00
ASSG	397.70
ASSR	480.50

PROCION COLOURS	Per Kg.
Golden Yellow HR	181.80
Brill. Yellow H4G	117.85
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	166.95
Yellow H-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	243.95
Yellow M GR	326.05
Brill. Yellow M4G	177.10
Brill. Yellow M8G	332.30
Yellow M 3R	217.60
Brill. Orange H 2R	241.85
Brill. Red H 7B	157.95
Brill. Orange M 2R	313.15
Brill. Red H 8B	169.45
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.30
Brill. Red H-F3B	243.45
Brill. Magenta HB	167.00
Brill. Red M 5B	98.90
Brill. Red M 8B	173.70
Brill. Pink MB	137.10
Brill. Magenta MB	121.55
Brill. Purple H-3R	180.20
Brill. Purple H-7R	175.40
Navy Blue H 3R	298.50
Brill. Blue H-GR	366.55
Brill. Blue H 5G	173.10
Blue H 5R	283.85
Brill. Blue H 7G	178.70
Brill. Blue H 7RX	358.15
Turquoise HA	234.45
Supra Blue H-3RP	335.70
Supra Turquoise H 2GP	181.50
Blue H-ERD	305.80
Navy Blue H ER	258.60
Blue H 5RX	269.30
Navy Blue M 3R	310.95
Brill. Blue MR	331.70
Brill. Blue M RX	214.20
Brill. Blue M-G	382.30
Blue M 4GD	344.60
Navy Blue M RB	318.75
Turquoise M-G	197.85
Brill. Blue M GX	302.50
Blue 3R Acra Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide (per kg.)	285.00
Green H 4BD	269.80
Green H-E4BI	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.80
Black H-N	283.35

SULFUR COLOURS	Per Kg.
Navy Blue	99.85
Green G	198.55
Black Grains Extra	63.05
Black Grains OG	64.55
Black GXE Conc.	61.60
Black GXE	52.75
Black GXR	61.60
Black Grains 800	54.20
Black EXR Grains	64.55
Black EXR Grains 800	51.25

VAT COLOURS (ICI)	Per Kg.
Yellow 5G Powder Fine	673.15
Yellow 5G Supra Disperse	439.30
Yellow 5G Acra Con.	628.75
Yellow 3R Powder	588.85
Gold Orange 3G Pdr. Fine	952.15
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp.	601.30
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	997.80
Brill. Red 3B Supra Disp.	713.20
Brill. Purple 4R Conc. Pdr.	470.75
Brill. Purple 3R Acra Powder	690.85
Brill. Purple 2R Hly Conc.	597.90
Brill. Purple 4R Supra Disp.	500.05
Brill. Purple 2R Acra Conc.	625.95
Blue R Powder Fine	542.15
Blue BC Conc. Pdr. Fine	522.50
Blue BC Acra Conc. Pdr. Fine	762.70
Blue R Conc. Pdr. Fine	577.65
Blue RR Supra Powder	629.35
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	389.25
Blue BC Supra Disp.	359.40
Jade Green XBN Powder Fine	438.20
Jade Green XBN Acra Conc. Powder	823.90
Jade Green 2G Pdr. Fine	419.65
Jade Green 2G Ptg. Faste	125.40
Jade Green XBN Ptg. Paste	126.00
Jade Green 2G Supra Disp.	496.00
Olive Green B Pdr. Fine	399.90
Olive D Pdr. Fine	444.30
Olive Green B Supra Disp.	308.26
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Pdr. Fine	698.55
Olive OMW Supra Disp.	538.05
Olive R. Pdr. Fine	422.96
Olive D Supra Disp.	361.70
Olive R Supra Disp.	363.90
Olive D, Ptg. Paste	193.00
Olive Green B. Ptg. Paste	199.10
Olive Green B Acra Conc.	542.75
Olive R Acra Conc.	640.00
Olive Green B Acra Conc.	542.75
Brown R Pdr. Fine	835.00
Brown G. Pdr. Fine	795.00
Brown R Pdr. Fine	659.75
Dark Brown 3R Pdr Fine	685.00
Brown G. Supra Disp.	449.90
Brown 2G Supra Disp.	554.00
Brown R Supra Disp.	422.95
Brown BR Powder	719.00
Dark Brown 3R Ptg. Paste	217.15
Dark Brown 3R Supra Disp.	414.55
Brown G Acra Conc.	733.95
Brown R Acra Conc.	766.00
Grey M. Powder Fine	768.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	330.35
Direct Black AC Pdr. Fine	474.70
Direct Black CH Supra Disp.	393.20
Direct ACD Ptg. Paste	217.15

Delhi Market

DELHI: MAY 20 (NNS) — Soda ash Tata and soda bicarb hardened by Rs. 5 each in the Delhi chemicals market during last week, followed a hike in its prices by manufacturers, reports NNS. Sodium hydro sulphite also flared up by Rs. 3 while sodium nitrite and tartaric acid slipped by Rs. 25/100 in the absence of offtake. Turnover was poor.

Soda ash Tata edged up by Rs. 5 at Rs. 300 owing to hike in its prices by Tatas from Rs. 288 to Rs. 297 per bag. Soda bicarb also moved up by Rs. 5 at Rs. 260/280 on tight stock and increase in its prices by manufacturers.

On reports of about 12 tonnes of the commodity despatched for Calcutta from Delhi as well as acute shortage of stock, sodium hydro sulphite, Damosha and Tamil Nadu jumped up from Rs. 35 to Rs. 38 and Kalali hydro sold higher at Rs. 40 against Rs. 37.

In the absence of offerings from U.P. menthol, flake, medium and bold flared up sharply by Rs. 10/14 at Rs. 174 Rs. 184 and Rs. 190 per kg. respectively, on hoarding tendency by stockists.

Tartaric acid suffered a fall of Rs. 100 at Rs. 6700 (per 50 kg) on slack offtake in face of increased import from France. In the first week of February the commodity was quoted at Rs. 7200. Citric acid small dana, however, improved by Rs. 50 at Rs. 2100 due to poor inflow of Chinese goods. Citric acid bold quality was quoted at Rs. 2400.

Paraffin wax dropped sharply by Rs. 15 at Rs. 580 (per 50 kg) in the absence of demand from Punjab traders due to terrorist activities. Refined wax also lost Rs. 10 at Rs. 690.

Sodium nitrite slipped by Rs. 25 at Rs. 775/800 on poor buying interest. Sodium nitrate ruled quiet at Rs. 400/425.

Turnover was poor in dyes and colours in dull trading.

(DELHI MARKET RATES AS ON MAY 20, 1988)

Ammonia Bicarb (per 25 kg)	118.00
Mercury (per flask)	10,500.00
Soda ash (per bag)	270-300.00
Ammonium chloride (per 50 kg)	115-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg.)	400-405.00
Citric acid (per 50 kg)	2100-2400.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCl (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg.)	90.00
Sod. Bicarbonate (per 50 kg)	260-280.00
Sod. Hydro Sulphite (per kg)	38-40.00
Rangolite (per kg)	48-65.00
Boric acid Technical (per 50 kg)	980.00
Paraffin wax (per 50 kg)	580.00
Tartaric acid (per 50 kg)	6,700.00
Borax Granular (per 50 kg)	575.00
Borax Crystal (per 50 kg)	600.00
Sodium Nitrate (per 50 kg)	400-425.00
Sodium Nitrite (per 50 kg)	775-800.00
Camphor Powder (per kg)	87.00
Camphor Thal (per kg)	97.00
Menthol Medium (per kg)	184.00
Menthol Flakes (per kg)	176.00
Menthol Bold (per kg)	192.00
Glycerine (per kg)	42-43.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	42.00
Acetic Acid Glacial (per kg)	13-13.50
Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	26.50
Formaldehyde (per kg)	8.00
Hydrogen Peroxide (per kg)	29.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	22.00
Acid Slurry Hard (per kg)	30.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1050-1150.00
Tri-Sod. Phosphate (per 50 kg)	325-360.00
Titanium Dioxide Anatase (per kg)	48.50
Titanium RC-822 (per kg)	63.00
Zinc Oxide (per mt)	35,000-40,000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	19.00
Chloroform (per kg)	28.00
Sodium Sulphate (per 50 kg)	170.00
Naphthalene Balls (per 50 kg)	1400.00

DYES & COLOURS	per kg.
Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

DIRECT DYES	(per kg)
Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.15
Basic Auramine O' Conc.	55-100.00
Basic Rhodamine B.500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00

Madras Market

Tamil Nadu Government announced eduction of Sales Tax in respect of lydros from 8% to 4% single point hereby helping the local Manufacturer Tamil Nadu Chemical Products Ltd. Caustic Soda prices ruled firm due to poor availability. Caustic Soda Lye was quoted at Rs. 7600-Rs. 7800 per MT while Flakes were Rs. 8400. Toluene and xylene prices came down on better availability. There was demand for formaldehyde due to closure of local unit for want of Methanol. Menthol prices came down sharply due to arrival of fresh mentha corp. from UP sources. Price of PVA powder is going up steadly due to fluctuation in yen exchange rates. Otherwise the markets were quiet.

(MADRAS MARKET RATES AS ON MAY 21, 1988)

Acetic Acid — Glacial (per kg)	17.00
Acid Slurry (Soft) (per kg)	26.00
Aluminium Sulphate Iron free (per tonne)	1,700.00
Ammonium Bi-carbonate (per 25 kg.)	125.00
Ammonium Chloride SPIC (per tonne)	1800.00
Bleaching Powder — Mettur (per 25 kgs. bags)	125.00
Borax Granular	675.00
Cresylic Acid 100% (per kg)	85+E.D
Meta Cresol 40/42% (per kg)	47.00
Para Cresol 80/85% (per ton)	60+E.D
Caustic Soda Flakes (Mettur) (per ton)	8,400.00
Caustic Soda Flakes (Andhra Sugar)	8,400.00
Citric Acid — Indian (per kg)	45.00
Copper Sulphate (per 50 kg.)	1000.00
Formic Acid (India) (per kg)	27.00
Formaldehyde (per kg)	8.00
Glycerine (per kg)	42.00
Hydrosulphite of Soda TCPL (per kg)	32.00
Hydrosulphite of Soda IDI (per kg)	36.00
Hydrosulphite of Soda BASF (per kg.)	38.00
Hydrogen Peroxide (India) (per kg.)	35.00
Hyflo Supercell	19.50
Magnesium Carbonate Light	18.00
Potassium Bichromate (per kg)	26.00
Phosphoric Acid (per kg)	18.00
Phthalic Anhydride (per kg)	24.00
Pentaerythritol (per kg)	52.00
Paraffin Wax (per kg)	13.50
Oxalic Acid (per kg.)	20.00
Soda Ash (TAC) (per 75 kg)	315.00
Soda Ash (TATA) (per 75 kg)	320.00
Sodium Cyanide Indian (per kg.)	47.00
Sodium Cyanide Degussa (per kg)	70.00
Sodium Bichromate (per kg)	19.00
Sodium Bicarbonate (per 50 kg)	280.00
Sodium Nitrite (per 50 kg)	750.00
Sodium Nitrate (per 50 kg)	425.00
Sodium Silicate (per tonne)	4000.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,500.00
Sodium Bi-sulphite (per 50 kg)	190.00
Stearic Acid (per kg)	31.00
Trisodium phosphate (per 50 kg)	380.00
Titanium Di-oxide Indian TTP (per kg)	52.00
Titanium Di-oxide Indian Rutile (per kg)	58.00
Urea Tech (per tonne)	2800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	13.00
Zinc Sulphate (per tonne)	4000.00
Di-octyl phthalate (per kg.)	47.00
Di-butyl Phthalate (per kg.)	46.00
Hexamine (per kg)	28.00

SOLVENTS

Acetone (H.O.C.) (per kg)	15.50
Isopropyl Alcohol NOCIL (per kg.)	21.50
Diacetone Alcohol NOCIL (per kg)	26.50
Benzene SAIL (per kg)	15.00
Diethylene Glycol NOCIL (per kg)	34.00
Butanol NOCIL (per kg)	34.00
Toluene SAIL (per litre)	12.00
Xylene IPCL (per litre)	14.00
Phenol HOC (per kg)	28.00
Turpentine (per litre)	13.50
Sorbitol (per kg)	35.00
Trichloroethylene MCIC (per kg)	23.50
Carbon Tetra Chloride (per kg)	15.50
Chloroform (per kg)	25.25
Methylene chloride (per kg)	23.25
Methyl Ethyl Ketone (per kg.)	42.00
Cellosolve (per kg)	48.00
Triethanolamine (per kg)	23.50
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg)	42.00
Methanol (per litre)	10.00

Materials Exported

BOMBAY
(From 20.1.88 to 24.1.88)

ALUMINIUM CHLORIDE: To Felixstowe : Klinbe Chemicals Pvt. Ltd., 16,800 kgs., Rs. 2,26,000.

ALUMINIUM CHLORIDE ANHYDROUS GRANULES: To Felixstowe : Mangalam Rasayan Pvt. Ltd., 19,800 kgs., Rs 2,03,603; To Genoa : Mangalya Trading & Investment P. Ltd., 35,750 kgs., Rs. 3,71,000.

ALUMINIUM NITRATE : To Colombo : Ardheshir C. Engineer & Co., 200 kgs., Rs. 3,600.

P-AMINOBENZENE P-SULPHONIC ACID : To Genoa : J.K. Promotions, 1,700 kgs., Rs. 94,149.

BENZIDINE DI HYDROCHLORIDE: To Pireaus: Jindal Dye Intermediate P. Ltd., 15,819.9 kgs., Rs. 4,47,000.

BLEACHING POWDER : To Aquaba : Modi Alkalies & Chemicals Ltd., 20 Mts., Rs. 86,000. To Dubai : Grasim Industries Ltd., 19,200 kgs., Rs. 63,000.

BUTYRIC ACID: To London: Hindustan Lever Ltd., 100 kgs., Rs. 24,000.

CHINA CLAY : To Dammam: Selective Minchem & Colour Industries, 20,000 kgs., Rs. 54,531; To Mina Qaboos : Jain Exports Corporation, 20.9 Mts., Rs. 38,633.

CHLORIDE OF LITHIUM PURE GRADE : To Antwerp : National Marketing Corporation, 300 kgs., Rs. 19,000.

CHLOROFORM 99.9% : To Busan : Gujarat Alkalies & Chemicals, 32,000 kgs., Rs. 1,89,691.

DICALCIUM PHOSPHATE : To Penang : Nayankumar & Co., 20,000 kgs., Rs. 52,655; To Port Kel : Nayankumar & Co., 60,000 kgs., Rs. 1,57,265; To Singapore: Nayankumar & Co., 1,00,000 kgs., Rs. 2,65,119.

2,6 - DICHLORO - 4 - NITRO ANILINE : To London : Nanavati & Co. Pvt. Ltd., 8,000 kgs., Rs. 6,52,809.

DIMETHYLAMINE HYDROCHLORIDE : To Aquaba : Srinivas Chemical Industries, 11,340 kgs., Rs. 2,52,951.

ENDOSULPHAN TECHNICAL 94% MIN. : To Rotterdam: Excel Industries Ltd., 39,600 kgs., Rs. 29,51,380.

FERROUS FUMERATE USP: To New York : Salvi Chemical Industries, 2,000 kgs., Rs. 48,543.

GAMMA ACID: To Hamburg: Monarch Dyestuff Industries, 2,755 kgs., Rs. 3,15,090; To New York : San Chem Enterprises, 2,160 kgs., Rs. 2,04,112.

GUAR GUM : To Antwerp : Premcem Gums Ltd., 5,000 kgs., Rs. 1,36,250; To Bergamo : Indian Gum Industries, 46,000 kgs., Rs. 13,10,702; To Dalton : International Commercial Enterprises, 54,000 kgs., Rs. 11,88,567; To Hamburg : Indian Gum Industries, 60,000 kgs., Rs. 14,86,492; Indian Gum Industries Ltd., 20,000 kgs., Rs. 4,52,501; Shiv Enterprises, 20 Mts., Rs. 2,70,619; To Houston : Adarsh Guar Gum Udyog, 72 Mts., Rs. 16,32,063; Gandhi Enterprises, 72,000 Mts., Rs. 16,00,515; Inlian Gum Industries, 80,000 kgs., Rs. 12,50,000; Jai Bharat Gum & Chemicals, 1440 kgs., Rs. 14,65,979; New Krishna Gum Industries, 72 Mts., Rs. 15,98,948; Nolaram Dulichand Dal Mills, 72,000 Mts., Rs. 16,32,063. Sarada Gum & Chemicals, 72,000 Mts., Rs. 16,00,575; To La Spayia : Hathibhai Bulakhidas, 20,000 kgs., Rs. 4,92,773; To Le Havre : Indian Gum Industries, 38,000 kgs., Rs. 8,54,640; To Los Angeles: Indian Gum Industries Ltd., 17,236 kgs., Rs. 4,03,218; To Manila: Indian Gum Industries, 3,000 kgs., Rs. 72,633; To Osaka: Prem cem Ltd., 18,000 kgs., Rs. 4,12,371; To Rotterdam: Sanjay Company, 20,000 kgs., Rs. 4,80,670; To Saskatoon: Dinesh Enterprises, 36 Mts., Rs. 8,91,722; Dinesh Enterprises, 4.040 Mts., Rs. 1,00,920; H.B. Gum Industries P. Ltd., 20 Mts., Rs. 4,63,918; To Toronto : Wizeon Forms P. Ltd., 20,000 kgs., Rs. 4,21,454; To Yokohama : Premcem Gums P. Ltd., Rs. 4,65,722.

GUM KARYA : To Avonmouth : Jethabhai Hiriji & Co., 15,990 kgs., Rs. 6,90,000; To Felixstowe : Ratansey Dami & Co., 16,000 kgs., Rs. 4,40,400; To New York : Shree Export Enterprises, 16,000 kgs., Rs. 5,43,000; To Yokohama: Krystal Colloids, 5,040 kgs., Rs. 2,70,000.

H.-ACID : To Antwerp : Zenith Limited, 16,450 kgs,, Rs. 18,69,000; To Barcelona : Allied Dyes & Chemical Industries, 5,880 kgs., Rs. 5,59,523; To Genoa : Janson International, 2,900 kgs., Rs. 2,24,226; To Hamburg: Sajjan Impex P. Ltd., 14,100 kgs., Rs. 14,60,905; To Karachi : Alpha Products, 5,821 kgs., Rs. 5,16,495.

HYDROCHLORIC ACID : To Dubai : Chemco Drilling Fluid, 100 Mts., Rs. 1,57,254.

INORGANIC CHEMICALS : To Mina Qaboos : Grasim Industries Ltd., 250 Mts., Rs. 3,00,000; To Tonga: Asian Paints Ltd., 1,010 kgs., Rs. 5,985.

INORGANIC PIGMENTS : To Chittagong : Colour-Chem Ltd., 300 kgs., Rs. 5,219; Colour-Chem Ltd., 700 kgs., Rs. 12,179.

INSECTICIDES : To Long Beach : Excel Industries Ltd., 13,200 kgs., Rs. 10,21,025.

IRON OXIDE RED : To Mombasa : Allwyn Chemicals, 111 Mts., Rs. 1,59,840.

MAGNESIUM NITRATE : To Colombo : Ardheshir C. Engineer & Co., 200 kgs., Rs. 3,800.

MANGANESE DIOXIDE : To Keelung : Industrial Chemical Agencies, 63,000 kgs., Rs. 2,62,812.

MEBENDAZOLE USP : To Hamburg : Euresian, 500 kgs., Rs. 2,48,000.

MENTHA ARVENSIS OIL : To Bangkok : Bharat Fine Chemicals P. Ltd., 5,400 kgs., Rs. 8,17,132.

METANILIC ACID : To Huddersfiel : Sadhana Nitrochem Ltd., 7,000 kgs., Rs. 2,85,249; To Keelung : Sadhana Nitro-Chem Ltd., 3,000 kgs., Rs. 96,880.

META PHENYLENE DIAMINE 4 SULPHONIC ACID : To Genoa : Navin Chemical Enterprises, 5,594.5 kgs., Rs. 4,30,880.

METHANOL FUEL : To Colombo : Madhra International, 2,800 kgs., Rs. 8,960.

METHYL ESTER OF COCONUT OIL : To Singapore : Bombay Extraction Ltd., 15.04 Mts., Rs. 1,54,912.

METRONIDAZOLE BP : To Chittagong : Unichem Laboratories, Ltd., 2,500 kgs., Rs. 5,37,867.

MYROBALANS : To Hong Kong : Jairamdas Khushiram, 10,000 kgs., Rs. 39,000.

NAPHTHOL ASOL : To Chicago : Amar Chemicals Industries, 3,000 kgs., Rs. 2,75,000.

ORGANIC CHEMICALS : To Rotterdam : Orgo Synth, 1,000 kgs., Rs. 1,66,000.

ORGANIC PIGMENTS : To Barcelona: Sudarshan Chemical Industries, 1,000 kgs., Rs. 1,27,279. To Genoa : Chika Ltd., 1,000 kgs., Rs. 1,12,113; Sanjay Sales Corporation, 8.000 kgs.. Rs. 9.16,098.

OXALIC ACID 99% MIN. : To Rotterdam : Excel Industries Ltd., 20,000 kgs., Rs. 1,59,794

OXYCLOZANIDE : To London : Gharda Chemicals P. Ltd., 2,000 kgs., Rs. 15,16,664.

PEPPERMINT OIL TERPENE : To Kobe : Bhagat Fine Chemicals, 7,200 kgs., Rs. 2,46,778.

PERCHLOROETHYLENE: To Japan : Hyderabad Allwyn Ltd., 10 Mts., Rs. 70,418.

PHOSPHOROUS TRICHLORIDE : To Aquaba : United Phosphorus Ltd., 1,47,000 kgs., Rs. 20,38,725.

POLYETHYLENE: To Japan: Transtamp Laminators, 22.5 Mts., Rs. 3,20,973.

RED OXIDE : To Manila : M.P. Chemicals Pvt. Ltd., 76 Mts., Rs. 64,432; To Mombasa : Jaysynth Dyechem P. Ltd., 700 kgs., Rs. 94,072.

RHODAMINE B 540% : To Felixstowe : Indian Dyestuff & Chemicals Mfg., 2,000 Rs. 3,15,374.

SILICA GEL : To Aquaba : Dineshchandra Indus., 10,000 kgs., Rs. 1,80,000.

SODIUM CYANIDE : To Barcelona : Cyanides & Chemical Co., 14,025 kgs., Rs. 2,25,918.

SODIUM IODIDE BP 80 : To Hamburg : Lub-cut Incorporation, 2,000 kgs., Rs. 4,47,164.

SODIUM META NITROBENZENE SULPHONATE : To Manchester : Sadhana Nitro-chem Ltd., 5,000 kgs., Rs. 1,09,810. To Rotterdam: Sadhana Nitro-chem Ltd., 14,000 kgs., Rs. 2,93,540.

SODIUM NAPHTHIONATE : To Karachi : Alpha Products, 5,634 kgs., Rs. 1,94,588.

SODIUM NAPHTHIONATE PURITY 75.5% : To Rotterdam: Priya Electronics & Chemicals Ltd., 2,700 kgs., Rs. 1,07,929.

STABLE BLEACHING POWDER : To Dubai : Grasim Industries Ltd., 18,000 kgs., Rs. 59,000.

SULPHURIC ACID : To France : Shivalik Kimelal Controls Ltd., 1,620 lbs., Rs. 16,840.

TALC POWDER : To Colombo : Balaji Enterprises, 20 Mts., Rs. 26,740.

THIONYL CHLORIDE : To Aquaba : Transpek Industry Ltd., 1,07,100 kgs., Rs. 8,13,973.

TRIPOLY SODIUM PHOSPHATE : To Dar-e-salaam; Metrochem Exports P. Ltd., 3,200 kgs., Rs. 60,710.

UNDECYLENIC ACID BP ZINC SALT : To Hamburg : Maxwell Pharmaceuticals Pvt. Ltd., 2,040 kgs., Rs. 1,59,085.

VANADIUM PENTOXIDE TECH-GRADE POWDER : To Dubai : Catalyst (India) P. Ltd., 1,700 kgs., Rs. 1,56,000.

Dyes Materials Exported

BOMBAY
(From 20.1.88 to 24.1.88)

ACID CROCEIN SCARLET MOO : To Genova : Colour Synth Industries P. Ltd., 1,000 kgs., Rs. 86,818.

ACID GREEN — 16 : To Genoa : Brinda Export Agencies, 500 kgs., Rs. 1,36,000. Karsandas Mavji, 300 kgs., Rs. 78,444.

ACID LIGHT FAST YELLOW 2B : To Genova : Colour Synth Industries P. Ltd., 1,000 kgs., Rs. 82,390.

ACID PATENT BLUE VS 200% : To Genoa : Colour Synth Industries P. Ltd., 500 kgs., Rs. 81,681.

ANTHRAMAR BRILLIANT VIOLET : To Chittagong : 100 kgs., Rs. 31,023.

ANTHRAMAR JADE GREEN B U CON. : To Chittagong : Amritlal Chemaux Ltd., 500 kgs., Rs. 1,77,616. 150 kgs., Rs. 52,336.

COAL TAR DYES : To Antwerp : Indian Dyestuff Inds. Ltd., 1,000 kgs., Rs. 1,89,299. To Bangkok : Indian Dyestuff Industries Ltd., 2,200 kgs., Rs. 2,03,820. To Barcelona : Indian Dyestuff Inds. Ltd., 1,500 kgs.,

Rs. 2,80,685. To Casablanca : Indian Dyestuff Industries, Ltd., 250 kgs., Rs. 47,777. 250 kgs., Rs. 43,747. 75 kgs., Rs. 9,946; To Marseilles : Indian Dyestuff Industries Ltd., 500 kgs., Rs. 91,078; To New York : Indian Dyestuff Inds. Ltd., 7,200 kgs., Rs. 21,34,726 ; To Rotterdam : Indian Dyestuff Inds. Ltd., 1,000 kgs., Rs. 1,20,949 ; 1,000 kgs., Rs. 2,07,888.

COLOUR-CHEM BLUE FFG EX. CONC. : To Chittagong : Colour-Chem Ltd., 500 kgs., Rs. 27,795.

COLOUR-CHEM GOLDEN YELLOW F3R EX. CONC. : To Chittagong : Colour-Chem Ltd., 300 kgs., Rs. 15,701 ; To Hong Kong : Colour-Chem Ltd., 3,000 kgs., Rs. 99,502.

COLOUR-CHEM GOLDEN YELLOW FRM EX. CONC. : To Hong Kong : Colour-Chem Ltd., 2,000 kgs., Rs. 78,773.

COLOUR-CHEM GREEN FB EX. CONC. : To Chittagong : Colour-Chem Ltd., 50 kgs., Rs. 3,369 ; To Hong Kong : Colour-Chem Ltd., 6,800 kgs., Rs. 3,49.586.

COLOUR-CHEM ORANGE FR EX CONC. : To Chittagong : Colour-Chem Ltd., 272 kgs., Rs. 16,679 ; To Hong Kong : Colour-Chem Ltd., 2,000 kgs., Rs. 87,065.

COLOUR-CHEM RED FBR EX. CONC. : To Hong Kong : Colour-Chem Ltd., 600 kgs., Rs. 51,741.

COLOUR-CHEM RED FFG. EX. CONC. : To Hong Kong : Colour-Chem Ltd., 3,500 kgs., Rs. 1,85,737.

COLOUR-CHEM RED FGR EX. CONC. : To Chittagong : Colour-Chem Ltd., 450 kgs., Rs. 32,254.

COLOUR-CHEM TURQUOISE FBN EX. CONC. : To Hong Kong : Colour-Chem Ltd., 500 kgs., Rs. 29,851.

COLOUR-CHEM VIOLET FFR EX. HLY. CONC. : To Colombo : Colour-Chem Ltd., 175 kgs., Rs. 31,116.

COLOUR-CHEM YELLOW EX. CONC. : To Hong Kong : Colour-Chem Ltd., 2,000 kgs., Rs. 80,431.

COLOUR-CHEM YELLOW FGG EX. CONC. : To Hong Kong : 3,000 kgs., Rs. 1,20,647.

DYE INTERMEDIATES : To Antwerp : Sandoz (India) Ltd., 10,348 kgs., Rs. 6,98,150. To Bangkok : Espee Chemicals, 10,694 kgs., Rs. 6,00,446 ; Vivid Exports, 6,780 kgs., Rs. 4,15,722 ; To Barcelona : San Chem Enterprise, 152 kgs., Rs. 1,26,113 ; To Belfast : Pridor Chem & Extraction P. Ltd., 5,000 kgs., Rs. 5,21,887 ; To Colombo : Ramakem P. Ltd., Rs. 2,232.; To Genoa : Sadhana Nitrochem Ltd., 18,000 kgs., Rs. 3,17,420. To Hamburg : Mangalya Trading & Indus. P. Ltd., 1,200 kgs., Rs. 1,00,900. To London : Indian Dyestuff Inds. Ltd., 15,000 kgs., Rs. 7,20,435. 15,000 kgs., Rs. 7,16,101. 6,311 kgs., Rs. 5,53,691; Mangalya Trading & Investment P. Ltd., 15,000 kgs., Rs. 6,76,576.

DYE INTERMEDIATES : To New York : Bhoir Import Export P. Ltd., 2,480 kgs., Rs. 2,26,992 ; Mangalya Trading & Investments, 3,000 kgs., Rs. 4,37,000 ; Nutan Dye Chem, 4,966 kgs., Rs. 5,24,626 ; Sagar Drugs & Pharm Ltd., 12,400 kgs., Rs. 7,00,000 ; To Piraeus : Jindal Dye Intermediates Pvt. Ltd., 6,267 kgs., Rs. 1,95,000 ; To Tokyo : Kantilal Sanghvi & Co., 5,000 kgs., Rs. 4,82,000.

DYES : To Dakar : Keshavlal Bhikhabhak, 1,277 kgs., Rs. 64,714 ; 500 kgs., Rs. 3,597.

FAST BLUE B BASE : To Singapore : Amritlal Chemaux Ltd., 1,000 kgs., Rs. 1,26,441.

Charleston : Uttamlal Pvt. Ltd., 3,000 kgs., Rs. 2,93,170; To Singapore : Amritlal Chemaux Ltd., 1,000 kgs., Rs. 1,07,804.

FAST SCARLET R BASE : To Chittagong : Amritlal Chemaux Ltd., 200 kgs., Rs. 20,046.

MALACHITE GREEN (POWDER) : To Piraeus : Jindal Dye Intermediates P. Ltd., 6,250 kgs., Rs. 4,75,000 ; To Singapore : Hemo Pharma P. Ltd., 8,000 kgs., Rs. 3,40,000.

NAPHTHOL YELLOW S : To Rotterdam : Matoba Industries, 500 kgs., Rs. 54,253.

NAVICTIVE TURQUOISE BLUE G : To Sydney : Indian Dyestuff Industries Ltd., 1,000 kgs., Rs. 1,00,670.

NAVINON BRILLIANT VIOLET RR UD : To Colombo : Indian Dyestuff Ind. Ltd., 250 kgs., Rs. 37,457.

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NAVINON JADE GREEN 2G UD : To Genoa : Indian Dyestuff Industries Ltd., 500 kgs., Rs. 1,28,919 ; To Rotterdam : Mangalam Trading & Investments, 2,000 kgs., Rs. 5,02,000.

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NAVINON YELLOW GCN UD: To Colombo : Indian Dyestuff Ind. Ltd., 250 kgs., Rs. 42,527.

ORGANIC PIGMENTS : To Hongkong : Colour-Chem Ltd., 1,450 kgs., Rs. 1,25,041.

REACTIVE BLACK 5 : To Piraeus : Bhoir Import Export Pvt. Ltd., 1,000 kgs., Rs. 81,121.

REACTIVE DYES : To Chittagong : Shree Dye Chem, 1,000 kgs., Rs. 1,06,505.

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REACTIVE VIOLET M2R : To Chittagong: Jasani Colour-Chem Inds., 400 kgs., Rs. 25,500.

REACTIVE YELLOW MAG : To Chittagong : Jasani Colour-Chem Inds., 250 kgs., Rs. 17,250.

REACTOFIX GOLDEN YELLOW HER : To Mombasa Jaysynth Dye Chem P. Ltd., 700 kgs., Rs. 94,072.

REACT ORANGE 16 : To Genoa : Karsandas Mavji, 250 kgs., Rs. 25,529.

REACTIVE VIOLET 5 : To Genoa : Karsandas Mavji, 275 kgs., Rs. 31,383.

SYNTHETIC COALTAR DYES : To Antwerp : Jindal Dye Intermediates Ltd., 3,000 kgs., Rs. 1,60,000 ; To Auckland: Navin Chemical Enterprises, 300 kgs., Rs. 52,380 ;500 kgs., Rs. 43,440 ; To Bangkok : United Chemie, 3,000 kgs., Rs. 1,90,722; To Chicago : Mangalya Trading & Investment, 300 kgs., Rs. 71,500 ; To Chittagong : Shree Dye Chem, 1,000 kgs., Rs. 81,669 ; 1,000 kgs., Rs. 1,13,009; 1,000 kgs., Rs. 65,769 ; To Colombo : Jaysynth Dye-Chem Ltd., 300 kgs., Rs. 54,928 ; To Hamburg : Jaysynth Dyechem Pvt. Ltd., 2,000 kgs., Rs. 4,12,455; To Hongkong : Indian Dyestuff & Chemical Manufacturers 1,000 kgs., Rs. 1,41,918 ; To Houston : Nitin Dye-Chem Pvt. Ltd., 2,010 kgs., Rs. 3,34,665 ; To Keelung : Indian Dyestuff & Chemicals Manufacturers 1,000 kgs., Rs. 1,36,662 ; K.P. Patel Chemo Pharma Pvt. Ltd., 1,000 kgs., Rs. 50,000.

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SYNTHETIC ORGANIC COALTAR DYES : To Genoa : Chika Limited, 3,000 kgs., Rs. 1,28,866 ; To Mombasa : Indian Products Trading Co., 3,400 kgs., Rs. 3,03,800.

SYNTHETIC ORGANIC DYES : To Antwerp : Priya Electronic & Chemicals, 1,000 kgs., Rs. 1,31,309 ; To Bangkok : Hind Dyes & Chemicals, 1,500 kgs., Rs. 80,150 ; To Chittagong: Amritlal Chemaux Ltd., 835 kgs., Rs. 2,95,597 ; To Genoa : Priya Chemicals, 125 kgs., Rs. 1,91,185. Priya Electronics & Chemicals Ltd., 5,000 kgs., Rs. 4,61,334. To Hongkong : Amritlal Chemaux Ltd., 2,500 kgs., Rs. 10,03,811. To New York : Rushi Sales, 1,000 kgs., Rs. 1,61,526.

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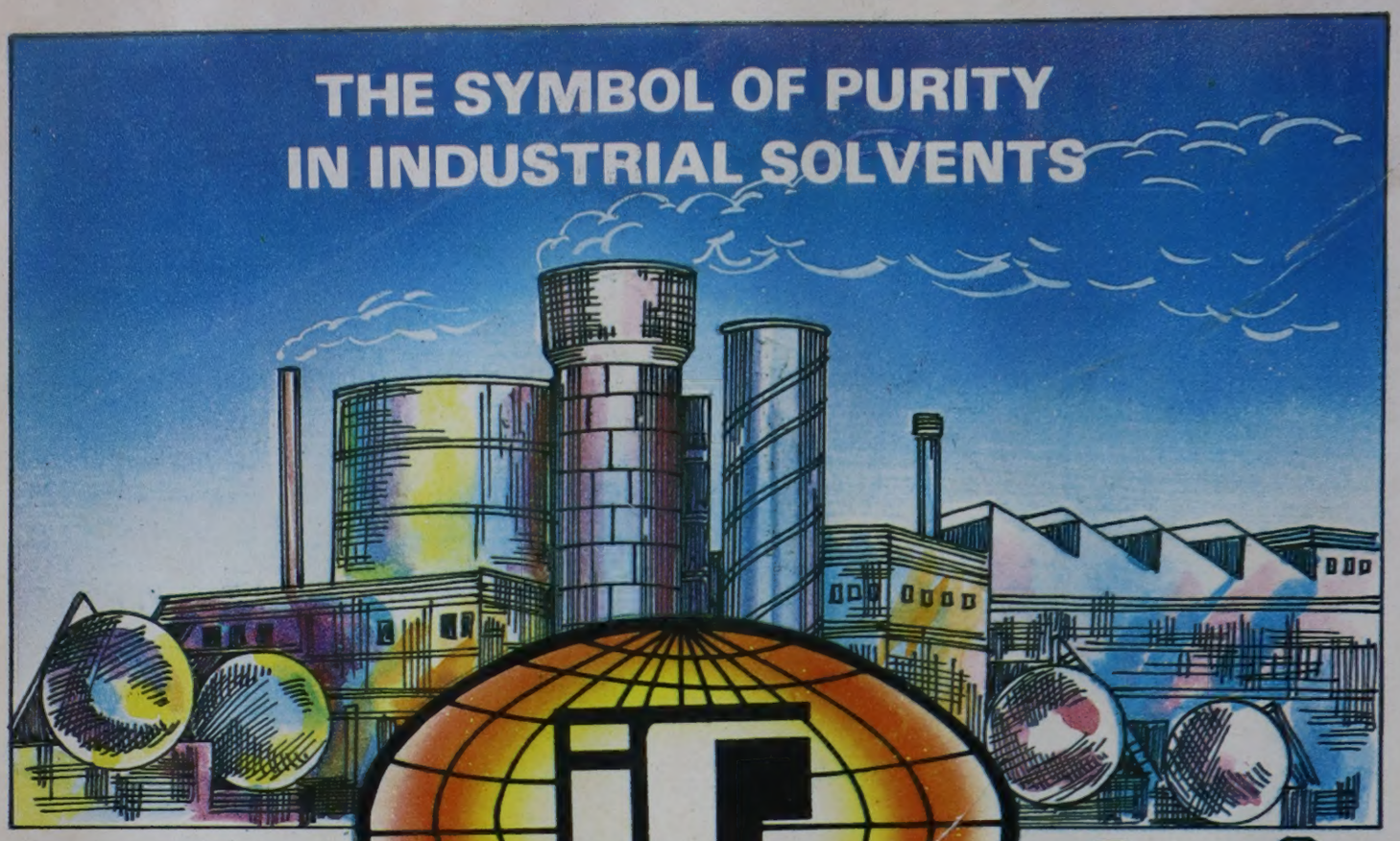

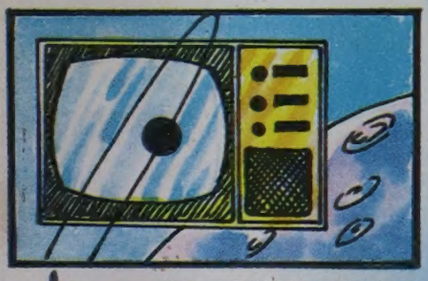

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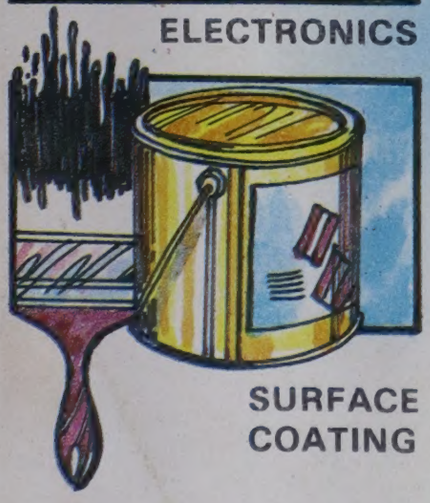

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